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Career Readiness

FOUR WAYS STATE POLICY MAKERS CAN HELP TRANSFORM THE HIGH SCHOOL EXPERIENCE FOR STUDENTS

GEORGIA HEYWARD

Introduction

States are looking to shift their North Star on expected outcomes for graduates. Instead of preparing students for career or college, they are transforming the high school experience to do both.

Decades of focus on college preparation in high school have improved opportunities for students, especially those who have been historically underrepresented in postsecondary institutions. However, overemphasis on college has created problems. High school curriculum has narrowed, and a bachelor's degree has become the credential employers look for, even though it is not necessary for many careers or universally valued by students.

Policy makers and practitioners are hoping that a new approach to career and technical education (CTE) will address these and other gaps in the high school-to-career continuum: the decreasing relevance of high school, rising costs in the postsecondary system, and current and projected workforce demands.

For years, states have offered career education via concentrated coursework and have connected students to industry through school-based enterprises, internships, or mentors.

But today, school systems face growing demands to coordinate career education programs with academic curricula designed to prepare students for postsecondary education. Some type of postsecondary certificate or degree is increasingly required for many living-wage professions. Shifting economic landscapes or simply the vicissitudes of life oblige adults to upskill or retrain. Some students complete a career pathway so they can earn money through college, attain skills that can complement a college degree, or continue postsecondary education. Instead of seeing college and career as an either/or proposition, states must prepare students for both.

States must also recognize that every school has the potential to connect students to careers. Schools across the country already offer programs focused on performing arts or on science, technology, engineering, and mathematics (STEM). How much more would students gain if

they were connected to professionals in those fields or required to demonstrate competency? And how much more would students in traditional career pathways, like the building trades, information technology (IT), or health care, benefit from the hands-on activities and academic rigor of a performing arts or STEM school?

There truly are opportunities to "rethink CTE," as the Department of Education encourages in the 2018 Strengthening Career and Technical Education for the 21st Century Act (Perkins V). Career education can result in secondary, postsecondary, and lifelong benefits for students, especially those who are under-resourced. These outcomes are only possible, however, in programs with certain features, such as concentrated career coursework, connection to industry, and a rigorous academic curriculum.

Many states lack clear goals and standards for career education. No state has consistent ways to communicate the variety of career education programs and the relative value of these opportunities. States are not clear about how, or for which outcomes, they should hold providers accountable. Many students do not have access to coherent, complete, industry-linked pathways. Policies related to credit award, funding, and diploma requirements act as barriers to local education agencies (LEAs) interested in offering high-quality career education. If students manage to find and enroll in a pathway, it may not prepare them for a career that offers a living wage; programs that do lead to high-wage careers are often not inclusive of all students. Once students graduate, they will still need credentials that show industry and postsecondary institutions what they have learned. However, many CTE programs and courses provide no such credential.[1]

These issues may seem insurmountable, but they are not. We offer four recommendations for state leaders to address these problems:

1. Coordinate strategy

2. Rethink credentialing

3. Provide consistent information for families and providers

4. Hold providers accountable

The task for state policy makers is to encourage quality, allow for innovation, and cull bad actors. State agencies have policy levers at their disposal to do this. States can establish a coherent, coordinated strategy for career education that creates a standard for quality and sets up accountability systems for equity and program monitoring.

States must coordinate with the institutions that students connect with after leaving high school: postsecondary systems and industry leaders. They must also change education

policies to remove unintended barriers. States must rethink credentialing so that it appropriately signals readiness to two-year colleges, four-year colleges, and future employers. Families and students must understand what the trade-offs are between different types of secondary education options and careers, so they can make informed decisions. To design appropriate programs, schools and districts must understand which careers offer a living wage and which are in demand. Finally—and most important—state agencies and policy makers must understand what kinds of career providers are in their state and how well they are serving students, especially those who are most vulnerable.

Terms Used in This Paper

Career and technical education (CTE): The most commonly used way to describe career education at the secondary level. The federal government first used this term in 2006 to signal a movement away from vocational/technical education and the blue-collar careers associated with it.

Career education: Preparation for any type of career, technical or not.

Career pathways: A program that prepares students for a specific career or career cluster. Our use of the term includes a concentrated sequence of career preparatory coursework. Career pathways can prepare students for a range of careers, some of which will require a postsecondary credential.

Career academy: A method of delivering career education. Students pursue a concentrated course of study in a single career and connect with industry through work-based learning. Career academies use project- or place-based instruction and teach students in small cohorts, or academies. Linked Learning typifies this model.

Work-based learning: A type of learning that connects students to the working world. It includes mentorships, job shadowing, industry-designed projects, school-based enterprises, internships, and apprenticeships.

Problem Areas

State policy makers must attend to four problem areas if they want to deliver on the promise of career education. While some states may be doing well in one or more areas, none have addressed them all:

1. States lack clear terms, goals, and standards in career education.

2. Credit award and funding policies prevent students from building coherent pathways.

3. Students do not have equitable access to career pathways that offer a living wage.

4. Schools do not confer appropriate credentials.

We explore the dimension of each problem and, where applicable, offer policy, research, and practice that can address it.

States Lack Clear Terms, Goals, and Standards

Career education offers promise to school districts seeking to deliver a more relevant education to both disengaged and thriving students. For industry and state policy makers, career education can prepare the next generation of employees or increase regional economic productivity. For families, students can explore possible careers, approach high school with greater focus, or prepare for immediate opportunities after graduation.

Schools, industries, families, and students have many aspirations for career education. But none of those can be accomplished as long as states are not aware of what programs currently do and what they should be accountable for achieving. Without clarity at the state level, schools will not know the standard they are striving for and families will not understand which type of program or career best aligns with student goals.

Career preparation programs in the United States offer a range of pathways and models but fail to communicate what they offer. For decades, districts directed youth deemed "not college material" toward career education programs. Preparation focused on blue-collar jobs; some offered a living wage (nursing, manufacturing), while others did not (cosmetology, child care). Today, a student can pursue high-paying technical careers like information technology or professional pathways like medicine or law. Career education programs, pathways, and initiatives differ wildly from state to state, district to district, and school to school. Many voc/tech programs continue. In some cases, schools offer only early childhood and auto shop. In others, voc/tech exists alongside "new" programs in entrepreneurship or environmental science.

Much of this variation occurs because career education in the United States is not a single, definable program. While states establish broad guidelines, LEAs have the freedom to open and redesign high schools. District and charter schools respond to local conditions and are informed by the vision of their boards and leaders.

Programs vary in other ways as well. Some schools offer a couple of classes in a pathway, but nothing more. Others advertise career pathways but offer only AP courses, without any specific career training or industry connection. Over the past fifteen years, some schools have started to approach career education as an instructional and curricular model that can benefit any student in any career. Some pathways complement college by integrating with two-year institutions that offer college credit and postsecondary certificates to their high school graduates. These schools recognize that career education and higher education are mutually reinforcing. Schools with career education may call themselves CTE, STEM, a career academy, a career pathway, or offer no label at all.

Figure 1. Career Education Is a Continuum from Exploration to Preparation in a Coherent Pathway

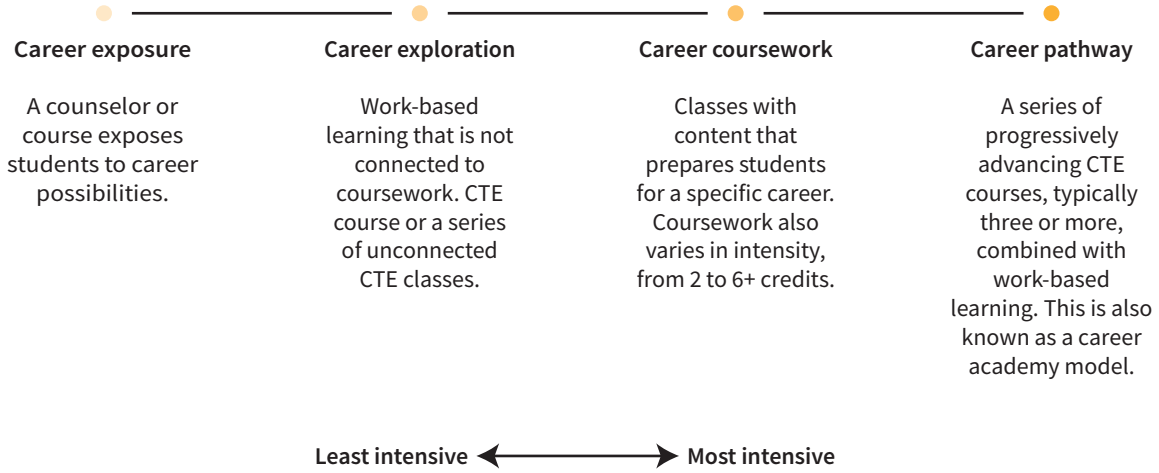
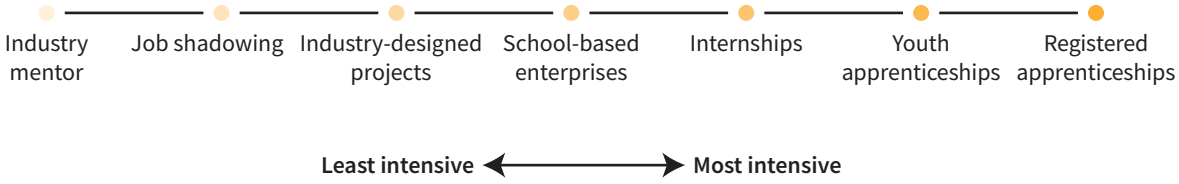


Figure 2. Work-Based Learning Varies in Intensity



This variation occurs because career education is a continuum from career exposure to true career pathways. As figure 1 shows, what people call CTE ranges from a couple of career classes to a coherent program that requires demonstration of skill attainment.

Work-based learning can complement career education or be the primary method that schools offer career training. It, too, varies in intensity, from mentorships and job shadowing to internships and apprenticeships. While all offer exposure, not all forms of work-based learning provide opportunities for students to apply the technical concepts they have learned in the classroom.

Few schools and no districts or states publish easy-to-access information about the careers that schools claim to prepare students for. Limited information is available about labor market prospects, related careers, or required credentials by career pathway. No information guide of career education providers exists—statewide or by region. Providers and states use no consistent language to clarify what it means when a school says “career pathway,” “career and technical education,” or “work-based learning.”

The decentralization of career preparation allows for innovation. But variation that is not strategic or not advertised results in missed opportunities. Without proper signaling of what a program is and what it is not, industry partners, teachers, and school leaders lack a common language to coordinate activities. Schools could provide overlapping programs, or there could be missed opportunities with local industry. At the state level, programs with similar career pathways miss opportunities to learn from one another.

Families and students are also at sea when it comes to understanding what type of programming is available and what they might reasonably achieve. Schools offer counseling, job fairs, and career days to help students learn about potential careers. However, other family members and a student's own counsel remain the most influential for students thinking about their career trajectories. Without basic information about career options and possible outcomes, families and students are not able to make informed decisions about the career pathways they are selecting.

Program providers are not held to consistent measures, and many are not included in state accountability systems. As discussed previously, there is no clarity about the purpose of career education among educators, policy makers, and community members. Is it a dropout prevention program, a hands-on approach to general education, or a way to fast-track students to employment?

School outcome measures are incoherent and not always reported publicly. Forty-four states have career-related measures that are used in school accountability systems. States are more likely to offer a menu of measures to report how students are doing (thirty states) than to require a specific set of measures (fourteen states) that apply to all schools. This menu gives LEAs flexibility to select the measure that suits their career preparation program. However, when states offer a menu of measures, it is impossible to compare one school's performance to another. Many states, like California, combine all career and college measures into a single score, so families and community members cannot see what proportion of students are completing CTE pathways, AP classes, or dual enrollment.

When career education programs are part of a state accountability system, families can see attendance trends and student body demographics just like any other school. But some states, such as Utah, do not include CTE schools in the state dashboard. In these states, families will not know how well schools are doing on even basic measures like graduation rates.

Some career education providers are never publicly reported on (see Career Preparation Happens in Many Ways). Part-time CTE centers are not found in any state reporting

system, even though 43 percent of districts report offering career training through regional centers. The most common form of career education delivery is through a comprehensive high school. However, comprehensive high schools are not required to report on the efficacy of CTE programs within their schools, so families do not know how well programs are doing relative to each other or to the general high school track.

Career Preparation Happens in Many Ways

Comprehensive school: A full-time school that houses multiple academies or curricular options, one or more of which include career pathways. Self-reporting by districts identifies this as the most common form of CTE delivery.

CTE center: Enrolls students from a specified number of surrounding districts. Students often enroll part-time starting in tenth or eleventh grade and receive a diploma from their home high school. Some CTE centers enroll students full-time starting as early as ninth grade. These are the second most common form of CTE program delivery.

CTE school: All the school's academies or curricular pathways are organized around one or more careers.

CTE district: All schools in a designated district offer career pathways. Like a CTE center, schools are open for enrollment from surrounding districts.

CTE network: Several related schools comprising charter and/or district schools. This can include a network within a district or a charter management organization (CMO) network that focuses on CTE.

Part-time program: Not an LEA and often does not confer graduation credit. Urban Alliance is one national model.

See appendix A for a description of these models, examples, and research about each program type.

Nonprofits in many cities offer career education on a part-time basis as a supplement to a student's high school education—not unlike a part-time CTE center. This often consists of coursework and work-based learning after school or during the summer. These providers are not monitored by any state education agency.

What We Know about Career Education Delivery Models

Most research has focused on career academies and programs with similar features—an integrated, multidisciplinary curriculum; a project-based instructional approach; a progressive sequence of CTE courses; a small cohort of students; and connection to real-world work. Research suggests that this combination results in more robust outcomes, especially for under-resourced students.[2] Research on career academies has found positive impacts on dropout rates[3] and graduation rates.[4] There are benefits just from completing CTE coursework[5] and results are greater as the number of courses increases. Participation in CTE has no impact on subject test scores.[6] But career pathways may have an effect on encouraging students to take a more rigorous course load.[7]

Unlike findings on school-related outcomes, which are fairly consistent across studies, postsecondary outcomes vary depending on the sample and study. Participation in CTE may or may not improve enrollment in two- and four-year institutions.[8] National and international studies tend to find that wages are higher for students in their late twenties who completed a CTE program of study than for those who did not.[9] But one study of eleven European countries found these results reversed once students hit middle age.

The efficacy of work-based learning is less clear, but research suggests benefits on their own and in combination with a course of study. Employers have identified "soft skills," such as critical thinking and cooperation, as needed for success in any workplace.[10] Employers also report that prior work experience has an impact on their hiring decisions. Research finds that work-based learning is most effective when combined with careful planning and alignment with a career pathway. Apprenticeships offer a fully aligned format for coursework and work-based learning, resulting in clear wage benefits for participants.[11]

We need to understand much more about the efficacy of specific delivery models. Are CTE schools or regional centers more effective? And under what conditions? What impact does career exposure or career exploration have? The variety found within CTE makes it difficult to interpret research that often focuses on a single type of program or, conversely, that generalizes across many different models. Research also does not typically offer subfindings based on career pathways, although there is reason to believe that different programs of study result in different outcomes.[12] There is little research on implementation; it is not clear how to scale effective models or how important certain program features are—such as instructional practice or cohort size.

Credit Award and Funding Policies Prevent Students from Building Coherent Pathways

Over the last fifteen years, a valuable body of literature has identified program features that result in better outcomes for students. Students benefit from coherent, aligned programs designed to ensure they develop a set of career-focused skills.

Research has shown:

- A sequence of coherent and increasingly advancing courses leads to decreased dropout rates and higher wages for students into their late twenties.

- A career academy model, which combines work-based learning, a small cohort of students, and college preparatory coursework improves graduation rates and may

result in increased postsecondary enrollment, especially for under-resourced students.

- Students benefit when they have the opportunity to apply theoretical coursework and develop general workplace competencies such as cooperation and problem solving. Workplace learning is one way to do this, but it should be linked to coursework to be most beneficial to students.

Policy in many states hinders efforts to develop programs aligned with research. As a result, students too often receive a smattering of unrelated courses not tied to practice in the workplace.

Flexibility in student schedules is not sufficient to remove barriers in career education participation. Districts report that finding time in student schedules is the largest barrier to student participation in career education. However, no state's credit requirements actually bar students from taking three or more career education classes.

Every state's graduation requirements allow flexibility in student schedules in one of three ways:

- Offering specialized diplomas, or diploma endorsements, that encourage students to concentrate their coursework around a specific career focus
- Requiring three or more elective credits, which can (or must) include career education
- Requiring between thirteen and eighteen credits for graduation, which gives students flexibility to add credited or noncredited learning experiences to their course loads

Flexibility in state graduation requirements does not ensure opportunity. Only a third of all districts reported that their CTE programs were structured as career pathways. This points to implementation barriers in offering a coherent course of study that go beyond finding time in the schedule, such as local graduation requirements or availability of career-connected coursework.

Twenty-one states go beyond offering opportunity. They use graduation requirements to encourage schools to offer career coursework (see tables 4 and 5 in appendix B). In two states (Oregon and Georgia), students must select from a menu of electives that includes career coursework. Four states (Arkansas, Delaware, Maryland, and West Virginia) require all students to complete three or more credits in a career pathway. The remaining fifteen states have career diplomas or endorsements that a student can choose from. The diploma options require coursework and some combination of work-based learning, proof of general career skills, and proof of skill attainment.

Credit award and funding models prevent students from pursuing career education outside of school. Work-based learning has benefits to both career exploration and career preparation. It develops general employment competencies, or soft skills, and offers students the opportunity to apply theoretical knowledge.

In a survey of districts nationally, accessing work-based learning was the second most commonly cited barrier to student participation in CTE. In a scan that the Center on Reinventing Public Education (CRPE) did of career education programs, we found that work-based learning was typically optional, with opportunities dependent on the pathway and student. This is consistent with national data; fewer than a fifth of students reported participating in work-based learning.

Work-based learning is expensive, requires coordination with willing partners, and is sometimes not allowed under union, insurance, or workforce regulations. There are a number of resources to help states and LEAs address these barriers.[13] This analysis focuses on credit award and enrollment-based funding. As a baseline, schools need ways to award credit for work-based learning experiences while not losing money for the time students are learning outside of school.

Twice as many students report working or volunteering in a job related to their career goals as participating in a formal internship or apprenticeship. Students are pursuing valuable work-based learning experiences, but state credit and funding policies prevent this learning from being recognized.

The federal government does not specify a seat-time or hour requirement for credit. Some states have found ways to leverage this inherent flexibility by adjusting state definitions of "instruction" and "hour." Kentucky and Colorado specify that credit can be awarded for work-based or service learning as an elective credit. In these cases, a licensed coordinator must monitor the program and serve as coach. Florida and Colorado have redefined "hour" as equivalent hours for learning not offered by the school. Colorado goes further by offering local school systems a $1,000 incentive for every student who participates in work-based learning.

In total, eight states specify in their graduation requirements that credit can be awarded for work-based or real-world learning (table 1).

New Hampshire passed a bill in 2018 that allows nonschool providers to award graduation credit. When applied to career education, this would enable students to earn credit from work-based learning experiences and from nonprofit, county, or industry providers. Providers apply for the ability to award credit through the State Board of Education.

Table 1. Eight States Award Credit for Work-Based or Real-World Learning

	Credit for Real-World Learning
Colorado	Colorado passed a bill in 2016 giving schools financial incentives to encourage student participation in work-based learning.
Connecticut	Starting with the class of 2023, a local or regional board of education may grant a student one credit upon completion of educational experiences and opportunities that provide flexible and multiple pathways to learning, including CTE.
Indiana	2.5 required "flex credits" can be awarded for workplace learning.
Kentucky	LEAs can award an elective credit for work-based or service learning.
Maryland	Policy specifies that credit can be awarded for work-based learning. Different formats include a capstone project, integrated curriculum, and diversified curriculum (two credits in school and two credits "on the job").
Nebraska	Work-based learning is one of six credit options, for which two credits are required.
New Hampshire	Learn Everywhere, passed in 2018, allows non-LEA programs to offer credit. Programs must apply to the New Hampshire State Board of Education.
New Mexico	Policy states that elective credit can be awarded for apprenticeships.

Source: "College- and Career-Ready Graduation Requirements" (2015), Achieve website; researcher analysis of state graduation requirements.

Virginia uses a competency-based approach to awarding credit. The state allows specified industry-recognized credentials to count as end-of-course assessments, so students earn credit for industry-related learning regardless of the provider.

In most states, funding is tied to enrollment or instructional time. Schools only receive funds when a student is in school for all or most of the day. In Colorado, districts only receive funding when a student is at school at least five hours per day. This rigid funding model prevents LEAs from offering work-based learning because they face a financial penalty for doing so.[14]

Systems that tie funding to specific learning objectives, such as the award of an industry certification or a course credit rather than time spent in the classroom, remove a critical barrier to work-based learning.

Two states—Utah and Arizona—have adjusted funding models so LEAs can receive funds for high school students who graduate early to pursue postsecondary degrees. Florida allows LEAs and approved virtual learning providers to receive funds when students successfully complete courses through online providers. In both cases, LEAs receive state funds retroactively for students who have demonstrated persistence or completion in their nonschool-based study. These states offer models for how schools can maintain funding even while students learn outside of school.

Students Do Not Have Equitable Access to Career Pathways That Offer a Living Wage

Secondary education has a responsibility to prepare students for high-quality prospects equitably and inclusively. In career education, students must be exposed to and engaged in fields that offer long-term career prospects.

However, anecdotal evidence suggests that states may not be linking students to living-wage, high-demand careers. A recent Fordham study found that in ten cities, CTE programs were not aligned with national demand or high-paying local jobs.

There is also evidence that students are not equitably enrolled in coherent pathways. Students in a coherent pathway have a greater chance of success graduating from school. Students pursuing certain careers will have a greater chance of finding employment and earning a living wage.

Career pathways do not align with long-term career prospects. Perkins V requires that schools offer pathways in high-demand, high-wage careers. However, only about one-third of districts surveyed nationally coordinated with industry about which occupations are in demand.

Some schools offer newer pathways, such as those with a focus on IT, without altering traditional offerings like culinary arts, cosmetology, or early childhood, which have a national average salary of between $25,000 and $30,000.[15] This points to challenges with fully transforming existing CTE schools, which have teachers, business partners, and even community members invested in long-standing programs. It also highlights challenges in pivoting to needed careers, such as K–12 teachers, even while low-paying, related pathways—like child care—persist.

Most districts lack the capacity to analyze wage and employment data and do not have the knowledge—or context—to balance trade-offs between short-term employment opportunities and long-term wages and advancement. They cannot advise schools about which careers are in demand regionally or which will offer the best opportunities to students.

Schools are often left on their own to interpret data produced by business bureaus or regional nonprofits, where those exist. Two New Orleans schools, New Orleans Charter Science and Mathematics High School and Rooted, have used regional data to identify high-demand, living-wage careers. Rooted is making a bet on the long-term viability of IT, which is in demand both regionally and nationally. But some schools could make the mistake of locking students into a niche career that does not offer mobility. The MiLL in Peyton, Colorado, balances this tension by offering a woods manufacturing program. There are no

woods manufacturing employers in the rural area where the school is located, so the school places students in internships with manufacturing factories that use similar equipment. Students in the program are able to apply for regional or national employment.

There is a role for state education agencies to support LEAs in this work. Some states support districts and schools in identifying appropriate programs. Texas publishes a dashboard of statewide demand data as well as a list of approved pathways and course sequences. California takes a different approach by offering grants to LEAs to develop pathways aligned with regional demand.

Some schools will not be equipped to manage local pushback if established programs need to be cut because they do not offer good opportunities for students. State data and incentives can support LEAs in this hard work.

Under-resourced students are not equitably enrolled in high-quality career education. Earlier research in CTE identified evidence of tracking students of color and those from low-income households into low-quality career pathways. As recently as 2011, a study in California found that only one in ten graduates was both college- and career-ready. Under-resourced students were even less prepared.

In recent years, schools have put in place safeguards against the within-school tracking that plagued older voc/tech programs. Many offer an exploratory class in eighth or ninth grade so students can try different pathways before selecting one. And once students make a choice, they are not locked in; counselors help students move to a program or school that is a better fit. Massachusetts' regional CTE centers exemplify this approach, although CRPE researchers identified similar practices in CTE schools across the country.

Recent research has found limited evidence of within-school tracking, suggesting this is not the widespread issue it once was.[16] While within-school tracking may be on the decline, students do not have equal access to quality opportunities. Students from wealthier families are more likely than students from less wealthy families to attend a CTE school or part-time CTE center. However, the CTE schools that wealthier families are attending are more likely to have better programming: career academies with coherent pathways are found in CTE schools with greater frequency than in comprehensive high schools. A study of a career academy model in California, Linked Learning, also found that career academy schools struggled to achieve equitable enrollment.

Table 2 shows that white and Asian students are slightly more likely to concentrate their CTE courses in a single pathway than their black and Hispanic peers. Without a concentration, students are not learning at high skill levels and are less likely to see the benefits of career

Table 2. White and Asian Students Are More Likely to Concentrate in a Single Pathway Than Their Black and Hispanic Peers

	*Three or more credits in a **different pathway***	*Three or more credits in a **single pathway***	*Percent gap*
Black students	23.2%	18.2%	5 percentage points **fewer** students focused on a pathway
White students	19.9%	22%	2.1 percentage points **more** students focused on a pathway
Hispanic students	17.9%	16.4%	1.5 percentage points **fewer** students focused on a pathway
Asian/Pacific Islander students	11.5%	12.1%	0.6 percentage points **more** students focused on a pathway

Source: "Table H201. Percentage of public high school graduates with each career and technical education (CTE) course-taking pattern, by student race/ethnicity and sex: 2013," National Center for Education Statistics website.

education. Interestingly, this trend reverses for students with individualized education programs (IEPs) and students who are English language learners.

Why are wealthy students ending up in career and technical schools and centers? Why are black students less likely to concentrate their career course-taking? The data do not tell us that.

We do know that three-fifths of all career and technical schools have selective admissions requirements. They are more likely than other specialty schools to require admission tests and to request a student's academic record. Specialized admission requirements signal student intent to be part of a school that offers a different learning experience. But requirements can also act as deterrents.

Schools Do Not Confer Appropriate Credentials

Every career has a way of demonstrating baseline competence. A visual artist shows a portfolio of work, a nurse obtains a certificate or professional license, and an engineer earns a bachelor's degree in her field.

High schools have long been successful at preparing the visual artist, the engineer, or the journalist. For students in a high school that offers advanced coursework, a high school diploma and accompanying transcript successfully signal readiness for college, an internship, or an entry-level job.

As high schools expand the kinds of careers that they prepare students for, they must identify the best credential to signal competence. In this section, we explore two types of credentials: the high school diploma and certificates added to a high school diploma.

Our analysis suggests many career diplomas are not setting up students for professional success and may force students to make trade-offs between career preparation and rigorous academic coursework. Schools across many states struggle to offer students credentialing opportunities that industry values or that postsecondary institutions recognize.

Few career diplomas and endorsements demonstrate professional readiness. A bachelor's degree signals career readiness. It shows persistence and critical thinking, the soft skills that employers value[17] and that are needed for success in any workplace.

The high school diploma used to demonstrate students had attained these professional habits of success. Some states are trying to reestablish the high school diploma as a credential that signals focus, determination, workplace competence, and advanced skill attainment. Fifteen states currently have a career diploma or endorsement.

Career Diplomas and Endorsements

Career Diploma: Five states offer a CTE diploma: Florida, Louisiana, Ohio, South Dakota, Wisconsin.

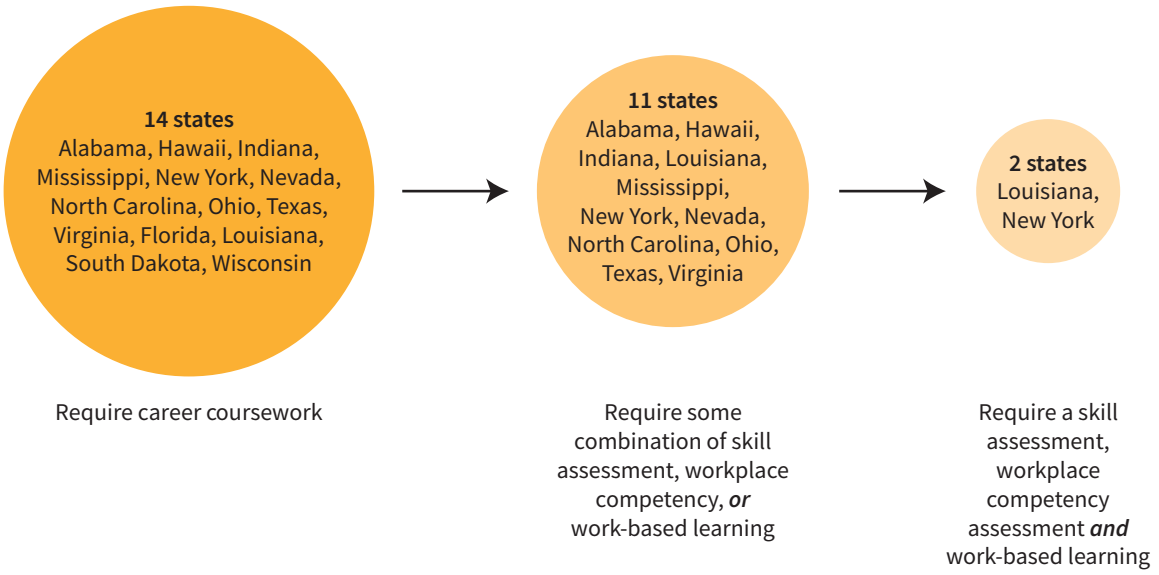
Career Endorsement: Ten states have career endorsements[19] that students can add to an existing diploma. Through an endorsement, students demonstrate competence in a specialized area of study. Students can add endorsements to a standard or college-preparatory diploma.

All fifteen states with a career diploma or endorsements require students to complete some career coursework (see tables 4 and 5). But only two, Louisiana and New York, require that students also demonstrate skill attainment in their career pathway, show proof of general workplace competency, and complete career training at the workplace. The success of career academies suggests that a cohesive career pathway with rigorous academic coursework, industry connections, and hands-on learning can be beneficial, especially for under-resourced students.

However, comprehensive career preparation can come with trade-offs. Over the past decade, states have adjusted high school graduation requirements to better align with college entrance by requiring levels of attainment (e.g., algebra II) and types of courses (e.g., foreign language). To meet the requirements of career diplomas, students may find they are no longer incentivized to take the advanced academic courses that will prepare them for college. In Louisiana, students must choose between the TOPS University Diploma, which prepares them for entry into a four-year institution, or a JumpStart Diploma, which prepares them for a career or two-year institution.

Endorsements are typically added to the diploma of the student's choice: standard or advanced. One such state is New York, which offers the only diploma or endorsement that requires students to pass a technical assessment for their career sequence, complete a work skills employability profile (much more comprehensive than the WorkKeys requirement of

Figure 3. Few States Require Demonstration of Technical Skill Attainment, Soft Skills, and Skill Application



many states), and engage in work-based learning—all the while taking college preparatory coursework.

A gap exists between credentials that are valued and credentials that are conferred. Arkansas, California, Colorado, and Massachusetts all offer comprehensive career education programs for students but do not use career diplomas or endorsements. Students in these states earn career credentials such as certificates, assessments, or professional licenses.

Credentials Matter offers a preliminary analysis of the credentials conferred by schools, finding that only about a fifth earned by K–12 students are valued or in demand by employers. Many careers will need more than an industry credential; they will require a postsecondary certificate or degree. Most secondary schools cannot offer postsecondary degrees, but they should confer a stackable credential, or one that will be recognized and used by postsecondary institutions like college coursework.

To address the disconnect between credentials conferred and credentials valued, states must address three issue areas: a lack of information about the extent of the problem, a misunderstanding about which credentials have value for which careers, and a lack of coordination between schools, industry, and postsecondary institutions.

Lack of information about the extent of the problem. As with other aspects of career education, better baseline data is needed to understand trends. What credentials are being conferred? Which providers offer them and for what kinds of careers? Many states

cannot answer these questions. As of 2016, only Nevada and Virginia publicly reported who received CTE diplomas. About half of all states collect data on student attainment of industry credentials, but only four receive that information from credentialing entities.

Misunderstanding about which credentials have value for which careers. About 700,000 different credentials are offered by education institutions, nonprofits, and industry, ranging from course completion certificates to postsecondary degrees. However, only some are of value. Without a way to determine and measure the quality of a credential, it is difficult for LEAs and states to determine which credentials actually provide labor market value. The National Skills Coalition offers four criteria that states can use to evaluate a credential: (1) job opportunities, (2) evidence of the competencies, (3) earning outcomes obtained by other credential holders, and (4) stackability to additional credentials or training. Virginia created a process to identify allowable credentials for FastForward programs aimed at young adults who want to complete short-term training in high-demand industries. Their application of this criteria to providers offers an example of how a state could do this for secondary institutions.

Lack of coordination. Some high-value credentials are difficult for secondary systems to offer. Apprenticeships, for example, have a high return on investment.[18] They are not as widely implemented as they could be because of the cost and burden on industry to set them up. Postsecondary credentials and associate degrees are also high value. When graduates work in the same field as their postsecondary certificate, they earn nearly as much as an associate degree holder. Associate degree holders in some fields, such as IT, can earn more than those with bachelor's degrees. However, setting up students to complete a certificate or associate degree requires close coordination with postsecondary institutions. If students only partially complete an associate degree in high school, they will be locked into completing the pathway at that institution unless articulation agreements allow transferable credits. Researcher interviews with experts in the field suggest that LEAs struggle to create the articulation agreements necessary to ensure credit earned at one college will transfer to another.

Recommendations for State Policy Makers

In the United States, secondary career education is not a single type of program offered by a specified provider. Some schools specialize in career education—these are CTE schools or centers—but it is far more likely a student will take career education classes in a comprehensive high school. An increasing number of high school students receive career education through nonprofits or postsecondary institutions.

The diversity of career education program types and the innovation found among them is exciting. Many programs are offering a high school education that teaches truly valuable skills, such as responsibility and cooperation, while building students' confidence and sense of self.

But all too often, these exciting and innovative programs are happening in isolation, led by a visionary school leader or superintendent. The same laissez-faire approach that allowed these programs to emerge and thrive has also enabled countless low-quality programs with disconnected coursework, no meaningful credential to show what students have learned, and only a fast track to low-wage jobs. (Anticipate the worst if you are a student of color from a low-income household.)

State policy makers need a coordinated, coherent approach to career education. The backbone of any approach must be coordination with industry and postsecondary institutions. Graduation requirements set a standard for what students have learned and are able to do. States can use graduation requirements to ensure students leave high school with an industry-recognized credential that will help them pursue the career of their choice, whether or not it requires further education. Families need information to make informed choices. Providers need information about regional and national employment trends, so they can offer programs that lead to long-term student success. States must be serious about monitoring the outcomes career education programs produce for their students and be prepared to take action when those programs are not offering high-quality learning experiences.

The task ahead for state policy makers can be summarized as four recommendations. Each one is necessary and all are interconnected. Below we offer a brief set of guidelines for each.

Four Recommendations for State Policy Makers

1. Coordinate strategy
2. Rethink credentialing
3. Provide consistent information for families and providers
4. Hold providers accountable

State policy makers should balance these recommendations with an analysis of their own state's policy. See appendix C for questions to guide this process.

Recommendation 1: Coordinate Strategy

Every state has a plan for CTE, but few have a strategy for career education that encompasses the diversity of providers, formats, and program models currently in place. That requires much tighter coordination across secondary, industry, and postsecondary systems. States must also coordinate education policy so it does not unintentionally pose barriers to local innovation and quality.

First, industry and postsecondary institutions need clear roles and responsibilities. A state education agency (SEA) is responsible for the basic education of students, so it must provide leadership. The SEA encourages program quality, monitors student outcomes, and steps in when programs are not delivering. Industry and postsecondary institutions have roles too: to inform programming and credentialing and to address regulatory and policy barriers.

Second, state agencies must look across K–12 policy to remove barriers to quality and access. They must facilitate the development of funding policies and credit award systems that will enable students to earn credit for learning experiences in the workplace and outside school walls. Linking credits and funding to a demonstration of competency, rather than enrollment, is one way to do that. Teacher licensing, scheduling, and curriculum must be addressed as a coherent system rather than a collection of independent policies.

Recommendation 2: Rethink Credentialing

Graduation requirements must strike a balance between universally encouraging quality while also allowing for variation based on industry and locale.

All states should vet credentials with industry and postsecondary institutions to identify what has value to whom.[19] Articulation agreements for credentials must be established between sectors and across providers within a sector. In this way, proof of what students have learned can maintain value across the high school-college-career continuum. Industry and postsecondary institutions can inform credentials through a coordinated governance structure. Flexibility is key, as both credentials and available careers will change.

States can consider using the high school diploma to drive program quality and offer a signal to industry and postsecondary institutions. Following New York's model, states can award career endorsements on top of a college preparatory curriculum so students do not face a trade-off between college and career. For example, students in Texas choose one of five career-related endorsements, which signal focus in the same way a major does in college.

Recommendation 3: Deliver Consistent Information for Families and Providers

Families and providers need transparent, consistent information about career education so they can make informed choices about program enrollment and career preparation. Providers also need information about what other schools are doing so they can fill gaps or form networks.

A statewide information system should include the following:

- A regularly updated dashboard of careers with short- and long-term wage and demand projections. The state should establish a threshold for "living wage" and "in-demand."[20]

- An annually updated list of all providers that offer career training for youth, including district, charter, nonprofit, county, industry, and postsecondary providers. Providers should be required to submit consistent information that may include pathways, admission requirements, enrollment, student supports, graduation rates, and credentials awarded.

- Annually updated student and school outcomes data as defined by the SEA (see recommendation 4).

This information should be user-friendly for schools, families, and students. Even though schools invest in career fairs and counselor support, families and the student's own counsel are the most influential factors in a student's career trajectory.

The state, or a contracted provider, should attend to how families will be given this information and how they will be supported in understanding it. Research in school choice suggests that passive guides do not work for all families. Families with limited time and resources benefit from one-on-one counseling support.

Recommendation 4: Hold Providers Accountable

States must understand who is delivering career education and what is offered.[21] The full range of providers that serve secondary students should be included in a state accountability system: district schools, charter schools, programs within comprehensive schools, part-time programs and centers, and nonprofits.

A goal of an accountability system should be to monitor program quality by program type and career and to ensure equitable outcomes for all students. States should close programs that are not meeting basic measures of attainment—whether it be in offering living-wage, in-demand opportunities, preparing students for lifelong learning, or producing students with career-related skills.

An accountability system should have two types of measures: one for measuring overall system health and one for monitoring the progress of specific providers. All measures must be vetted with industry and postsecondary institutions.

Measures for overall system health may include these:

- Long-term employment and wage impacts on students, according to pathways and provider type. States may want to use an existing statewide longitudinal data system to report workforce outcomes (or consider developing one if they are one of thirteen states without it).

- Postsecondary enrollment and completion.

Career education should be built into the state's accountability system so that it includes graduation, discipline, attendance, and assessments rates. In addition, it may include the following:

- Credential attainment by credential type and industry.

- Work-based learning by type and industry. Consider work-based learning as a continuum rather than a single activity.

- Articulation agreements across postsecondary institutions. Without these, postsecondary credit attainment is not a meaningful measure.

Conclusion

Secondary schools have a responsibility to prepare youth to enter adulthood. Students should leave high school not just career- or college-ready but life-ready. Career education is a means to that end, but it is not the goal. The goal is a system that recognizes the fluidity of our working, learning, and personal lives, both as students and adults. High school students across the country take college classes; adults may work for years before completing a postsecondary credential. States can tinker with a program or diploma, but unless they address career education as a system, and in relationship to the larger context of students' lives, they will produce no better results than they already have.

Many of the tools needed to effect necessary changes are already at hand. The work ahead is not insurmountable, but it will require an expanded vision of the educational process, guided by informed leadership willing to coordinate the transformation.

Appendix A: CTE Models

We offer an overview of CTE models and programs from a national scan of district, charter, and nonprofit CTE providers. For the methods we used in this scan, please see our project website.

Career Preparation Happens in Many Ways

Comprehensive (full-time) school: Houses multiple academies or curricular options, one or more of which include career pathways. Self-reporting by districts identifies this as the most common form of CTE delivery.

CTE center: Enrolls students from a specified number of surrounding districts. Students often enroll part-time starting in tenth or eleventh grade, receiving a diploma from their home high school. Some CTE centers enroll students full-time starting as early as ninth grade. These are the second most common form of CTE program delivery.

CTE school: All the school's academies or curricular pathways are organized around one or more careers.

CTE district: All schools in a designated district offer CTE coursework. Like a CTE center, schools are open for enrollment from surrounding districts.

CTE network: Several related schools comprising charter and/or district schools. This can include a network within a district or a charter management organization (CMO) network that focuses on CTE.

Part-time CTE program: Not an LEA and often does not confer credit.

Districts, charter schools, and nonprofits all deliver CTE programming to secondary students. Below we offer examples and relative tradeoffs of each model.

Noble High School in North Berwick, Maine, offers one example of a **comprehensive high school** redesign. In 2011 the district redesigned the school to offer pathways in IT, engineering, and the culinary arts alongside traditional college tracks. The school changed how learning happens for all students by organizing the school into small, interdisciplinary academies. Guided by a personalized learning plan, students move through course content at their own pace. All students have access to AP and dual-enrollment classes at the school and CTE electives through two regional technical centers. Unlike voc/tech education of the past, students can move in and out of college and career preparation as it suits their needs. There are several organizations that support school redesign into single or multiple career academies (see National Programs).

CTE centers offer a number of advantages. CTE programs allow for economy of scale, especially in rural areas. And when CTE centers are part-time, schools can specialize: home high schools focus on a student's foundational education in ninth and tenth grades,

manage accommodations for students with disabilities, and help students with college and career planning. CTE centers hire specialized teachers for CTE instruction and coordinate with industry.

Existing centers generally offer a traditional voc/tech education, but some have been able to innovate by adding new pathways and instructional approaches. Genesee Career Institute (GCI) in Flint, Michigan, is one such example. GCI is open to students in area high schools in eleventh and twelfth grades. College credit is available in most pathways, but students can also apply to the Michigan Early Middle College program, which allows students to graduate with both a high school diploma and a technical associate degree in five years, at no extra cost. GCI is launching an aviation pathway in 2019, developed in partnership with Bishop International Airport and the Greater Flint Pilot's Association. The Massachusetts Regional Vocational Technical Schools (RVTS) prepare students for both college and careers, with many of the program features found in career academies. While the RVTS schools all have selective admissions policies, some, like Essex North Shore Agricultural and Technical School, maintain demographic parity with nearby districts.

Some districts have worked together to form **new CTE centers.** Iowa BIG serves three districts in Iowa. There, tenth to twelfth grade students attend for half the day working on projects with a local business, nonprofit, or government agency. Iowa BIG does not define career pathways that students select. Instead, the school works with industry partners to ensure that each project aligns with competencies needed for that career or industry. (Iowa BIG is an example of a school redesign supported by the XQ Institute, which has worked with nineteen schools to integrate nontraditional instructional models and connect students to their community, often through mentorships and employer projects.) Two rural districts in Colorado combined their CTE programs to form a homegrown regional CTE center. Called The MiLL, the center operates as an extension of Peyton School District. Students from nearby districts enroll on a part-time basis, paying a percent of FTE to Peyton.

Some districts have opened new CTE schools or redesigned existing schools to include career pathways. One common way of doing this is through a **CTE network.** The Urban Assembly in New York City includes nine CTE schools in its network of twenty-two. As a whole, the Urban Assembly network is an example of how a school district can provide career diversity while maintaining consistency in the delivery of career-connected learning. At the Urban Assembly School for Emergency Management (UASEM), students choose one of two pathways: emergency management or cybersecurity. In both, they participate in hands-on learning facilitated by industry partners, such as the New York City Fire Department, the American Red Cross, and Con Edison. Upon graduation, many students go on to college. Schools in the Urban Assembly network vary in how well students do on English and math assessments, but UASEM does well in traditional outcomes while also enrolling a higher than average share of students in poverty and students with IEPs.

Among all district options available to students, about 10 percent are reportedly **CTE districts.** Like an existing CTE center or school, redesigning a CTE district to align with the aspirations of today's CTE can be daunting. District 214 in Illinois, however, offers an example of how this can be done. Wheeling High School started a career pathways transformation in 2007 that was eventually adopted by every school in the high school-only District 214. Now, all nine high schools have a standardized set of CTE programs—when there is variation, students have the option to take classes at another school. Most pathways include both AP coursework and industry certifications, simultaneously preparing students for college and employment directly out of high school. The district's Center for Career Discovery facilitates the coordination of work-based learning experiences, such as internships, industry tours, and job shadowing. All schools in District 214 are ranked as three or four (out of four) by the Illinois Department of Education. Wheeling maintains strong outcomes while enrolling a higher than average share of students in poverty.

Part-time CTE programs are not LEAs, but when operated by a district or district school, they carry credit. They may be a part of the district office or a spin-off program offered at a single school. Blue Valley Center for Advanced Professional Studies (CAPS) was started by a single school district in Overland Park, Kansas, and has since spread to eleven states. The eleventh and twelfth grade program offers high school and sometimes college credit in career pathways such as human services, health care, and business technology media. At PSJA Southwest Early College High School in Pharr, Texas, a high school teacher created the Southwest Marketing program for eleventh- and twelfth-grade students throughout the district. Students work with local businesses to develop marketing solutions while earning college credit at South Texas College.

CMOs and charter schools are most likely to provide instruction as a **CTE school**, although some, like the Da Vinci schools in California, operate as a network. While all the Da Vinci network schools offer an innovative approach to career-focused learning, Da Vinci Science is among the most successful in terms of traditional outcome measures, such as test attainment graduation, and college-going rates. The Center for Advanced Learning (CAL) in Gresham, Oregon, was formed as a regional **CTE center** for three area districts. The inherent flexibility of charter schools provides the autonomy to pursue scheduling and curricular changes consistent with CTE. District CTE schools may not be held to the same accountability standards as their district peers because they are considered alternative schools. Charter CTE schools, however, must meet authorizer requirements, like any other charter school, in order to remain open.

Nonprofits are emerging as a CTE provider for secondary students through **part-time CTE programs.** Nonprofits typically provide work-based learning and some coursework, often after school or during the summer. Because nonprofits are not LEAs, they are not regulated or held accountable for the learning offered to students. Their reach is limited, and they are found only in urban areas. North Bay Construction Corps, in Santa Rosa, California, is a partnership between North Coast Builders Exchange and the Sonoma County Office of

Education. The five-month course in the building trades offers training, work experience, and a certificate to twelfth-grade students and adults.

While not LEAs, some nonprofits are able to offer college or district credit through partnership with one of these entities. Whatever It Takes (WIT) gives teens an opportunity to design and launch a social enterprise or project after school while earning six college credits at the University of California, San Diego. Started in 2009 in San Diego, WIT has now expanded to Austin, Texas, St. Louis, and New York City. District C, in Raleigh, North Carolina, is an afterschool program that groups students from different high schools together into "C squads," which are tasked with solving a real-world problem posed by one of twenty IT and business companies. The nonprofit is working with Raleigh-area high schools to bring their curriculum into schools so the coursework can earn credit.

The Urban Alliance is one part-time program with sites in Washington, DC, Baltimore, northern Virginia, and Chicago. A third-party research organization conducted a randomized control trial of the program and found that young men who completed the program were more likely to attend two- and four-year colleges. Soft skill retention also improved.

National Programs

Transforming an existing model or opening a new school each come with challenges, especially for schools or districts without expertise in CTE. National models can offer schools a tested model along with technical assistance and a professional community. Three such models are P-Tech, NAF, and the National Career Academy Coalition. Researcher analysis finds that implementation of these models varies, as do outcomes. More research is needed to understand why implementation is uneven across these networks and under what conditions schools thrive.

P-Tech is a national and international program that provides a format for schools and districts to implement a 9–14 high school. Program features include work-based learning and a six-year high school experience that concludes with a high school diploma and an associate degree in a CTE area of study, at no cost. New York City has implemented P-Tech as a network of nine open-enrollment schools. Energy Tech is one of the better performing P-Tech schools in the city and the nation. The school opened in 2013 following a design process completed with LaGuardia Community College, Con Edison, and National Grid. MDRC is currently engaged in an evaluation of New York City's P-Tech model. An independent analysis of the model in Colorado, one of the eight states with P-Tech schools, identified two main barriers to implementation. In Colorado, districts apply to the State Education Agency for P-Tech status. The first barrier was maintaining business commitments needed to launch the work-based learning component. This could be improved by amending the state statute to allow intermediaries such as workforce centers or local chambers of commerce to support the district in bringing in work-based learning partners. The second barrier was the cost to the district when students attempt to condense their learning by taking summer

dual-enrollment classes. Recommendations included adjustments to the P-Tech funding formula to provide additional funding in years three and four of implementation or setting aside funds that districts could apply for.

NAF is a national nonprofit that helps schools develop small academies with career-connected curricula and work-based learning. An external evaluation of ten districts found that students in NAF schools were more likely to graduate; these gains increased when students completed the program of study. Researcher review of school report cards found varying English and math assessment outcomes for NAF schools. One of the more successful NAF models is Emmett J. Conrad High School. Started in 2008 with five different career-connected academies, students at Conrad learn through projects with companies and community organizations. In 2018 Conrad received Dallas ISD's highest score for school efficiency among the city's comprehensive high schools. The school also offers a P-Tech program for first-generation students who have been historically underrepresented in higher education.

The **National Career Academy Coalition** offers support to existing and emerging career academies through technical assistance, professional development, and advocacy. Pearl-Cohn Entertainment Magnet High School was formed out of a merger of two high schools in 1983 and is one of twelve Nashville high schools in the Academies of Nashville. Pearl-Cohn offers students AP and honors coursework along with dual enrollment and industry certifications. Juniors and seniors can take part in job shadowing and internships. Classes are organized in long blocks so students learn deeply through hands-on projects. The school also has a daily advisory meeting where teachers focus on social-emotional learning. The high schools that house Nashville's thirty-nine career academies range in quality, but Pearl-Cohn maintains strong outcomes while serving a higher proportion of economically disadvantaged students than the district average. Pearl-Cohn has been recognized as a model school by the National Career Academy Coalition.

Appendix B: Tables

Table 3. All States Have Flexibility in Their Graduation Requirements That Would Allow Students to Take Three or More Career Classes

Requirements	*States*
3+ elective credits, CTE credits, or a combination*	Alaska, Arizona, Arkansas, Delaware, Georgia, Hawaii, Idaho, Kansas, Kentucky, Maryland, Minnesota, Missouri, Nevada, Oklahoma, Oregon, New Jersey, New Mexico, New York, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, Washington, DC, West Virginia
Specialized diploma, competency-based diploma, or endorsement	Alabama, Colorado, Florida, Indiana, Louisiana, Maine, Massachusetts, Mississippi, Nevada, New Hampshire, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, Vermont, Wisconsin
13–18 credits required for graduation	California, Florida,† Illinois, Iowa, Michigan, Montana, Wyoming

** Excluded states that have a specialized diploma or endorsement and that have a low credit requirements.*

† Florida has both a CTE diploma and requires only 18 credits to graduate.

Table 4. Five States Have Career Diplomas That Range in Requirements

	Diploma	*Career skill assessment*	*General work skills*	*Work-based learning*	*College preparatory curriculum*
Florida	CTE Pathway Option: 2 CTE credits	**Yes:** Industry credential	**No**	**Depends:** 2 credits or substitute with electives	**No**
Louisiana	Jumpstart Diploma: 9 CTE credits	**Yes:** Industry certifications approved by the Workforce Investment Council	**Yes**	**Yes**	**No**
North Dakota	North Career and Technical Education Scholarship: 4–5 CTE credits	**No**	**Depends:** Can choose WorkKeys as an academic assessment option	**No**	**Yes:** Also, students given a $6,000 scholarship for postsecondary studies
Ohio	Career-Technical Diploma with Honors: 4 CTE credits.	**Yes:** Industry credential or proficiency on Ohio Career-Technical Competency Assessment	**Depends:** Can choose WorkKeys	**Depends:** Field experience requirement could include work-based learning	**Yes:** Also, requires 3.5 GPA
Wisconsin	Technical High School Diploma	**Depends:** Determined by LEA	**Depends:** Determined by LEA	**Depends:** Determined by LEA	**No**

Source: "High School Graduation Requirements, February 2019," Education Commission of the States; 50-State Comparison; State Policies Impacting CTE: 2018 Year in Review (Advance CTE and the Association for Career and Technical Education, 2019); Jennifer Zinth, "High School Diploma Options That Meet Federal Graduation Rate Calculation Requirements" (Denver, CO: Education Commission of the States, 2018); Achieve: "College- and Career-Ready Graduation Requirements (2015), Achieve website.

Table 5. Ten States Have One or More Career Endorsements That Can Be Added to a High School Diploma*

	Endorsement	*Career skill assessment*	*General work skills*	*Work-based learning*	*College prep curriculum*
Alabama	Advanced Career and Technical: 3+ CTE credits; Career and Technical: 3+ CTE credits	**No**	**No**	**No**	**Yes & no** (2 options)
Georgia	Career Ready Seal: 6 possible seals in Employability, Pathways, and Leadership: Credit requirement depends on seal	**Depends:** Pathway seal has credential and skill assessment in a menu of options	**Depends:** Required for Employability Seal	**Depends:** Part of a menu of options for all seal types	**Depends**

(continued)

Table 5 (*continued*)

	Endorsement	*Career skill assessment*	*General work skills*	*Work-based learning*	*College prep curriculum*
Hawaii	Career and Technical Education Honors: 2–3 CTE credits	**Yes:** Performance-based assessment for corresponding program of study	**No**	**No**	**No**
Indiana†	Core 40 with Technical Honors Endorsement: 6 CTE credits	**Depends:** Can select industry credential/ certificate OR 6 college credits	**No**	**No**	**Yes**
Mississippi	Career and Technical Endorsement: 4 CTE credits	**Depends:** Can select dual credit, work-based learning, industry credential	**Yes:** ACT WorkKeys	**Depends:** Can select dual credit, work-based learning, industry credential	**No**
New York	Technical Endorsement: CTE credit number not specified	**Yes:** Must pass technical assessment for CTE sequence	**Yes:** Complete work skills employability profile	**Yes**	**Depends**
Nevada‡	Career Ready High School Endorsement: CTE credit number not specified	**Depends:** Career and Technical Education Skills Attainment Certificate or industry-based credential are two options	**Depends:** ACT National Career Readiness Certificate as one option	**No**	**Yes**
North Carolina	Career Endorsement: 6 CTE credits	**Depends:** Industry certification/ credential is one option	**Depends:** ACT WorkKeys & Career Readiness are two options	**No**	**No**
Texas	5 career-related endorsement options: Business and Industry, STEM, Public Service, Arts and Humanities, Multidisciplinary Studies	**No**	**No**	**No**	**Yes**
Virginia‡	4 career-related endorsement options: Career & Technical Education, STEM, Civics Education, Biliteracy, Science & Environment	**Depends:** Yes for CTE & STEM	**No**	**Depends:** Yes for Civics and Science & Environment	**Depends**

** Ohio offers an OhioMeansJobs Readiness Seal. This was not included because it does not have course requirements.*

† LEA in Indiana receives $1,000 for every student who received a Core 40 Academic or Technical Honors Diploma.

‡ Nevada and Virginia require that students select one endorsement, which can be a career endorsement.

Source: "High School Graduation Requirements, February 2019," Education Commission of the States; 50-State Comparison; State Policies Impacting CTE: 2018 Year in Review (Advance CTE and the Association for Career and Technical Education, 2019); Jennifer Zinth, "High School Diploma Options That Meet Federal Graduation Rate Calculation Requirements" (Denver, CO: Education Commission of the States, 2018); Achieve: "College- and Career-Ready Graduation Requirements (2015), Achieve website.

Table 6. Eight States Have Competency-Based Diplomas

	Other diploma option	*Career skill assessment required by SEA*
Colorado	**Guaranteed Transfer:** Aligned with minimum requirements for entry into a public four-year institution.	**Yes:** Starting in 2021, Colorado districts can select from a menu of college-recognized assessments to measure student attainment of math and English, including ACT, IB, and concurrent enrollment.
Maine	**No:** For students graduating before 2021, 11 credits are required to graduate.	**No**
Massachusetts	**MassCore:** 5 elective credits, which can include CTE. Can replace 2 language credits with CTE.	**No**
New Hampshire	**No**	**No**
Oklahoma	**No**	**No:** College Preparatory/Work Ready Curriculum is required and aligned for college admission.
Pennsylvania	**No**	**No**
Rhode Island	**No**	**No**
Vermont	**No**	**No**

Source: "High School Graduation Requirements, February 2019," Education Commission of the States; 50-State Comparison; State Policies Impacting CTE: 2018 Year in Review (Advance CTE and the Association for Career and Technical Education, 2019); Jennifer Zinth, "High School Diploma Options That Meet Federal Graduation Rate Calculation Requirements" (Denver, CO: Education Commission of the States, 2018); Achieve: "College- and Career-Ready Graduation Requirements (2015), Achieve website.

Table 7. Eight Credential Types Offer Different Benefits*

	Description	*Industry*	*Value*
		Diploma	
CTE high school diploma or endorsement	Specific credential for students who complete CTE-related coursework and/or work-based learning and skills assessment.	Does not specify. Unknown which industries are more likely to value.	High school diplomas are still an important signal, although they hold less value than they once did.
IB Career-related Programme (CP)	Curriculum combines IB with service learning, professional skill building, and a final project.	Liberal arts: language, science, arts, mathematics.	In limited use. Could be good for students who anticipate needing a postsecondary degree in a liberal arts field.
Associate degree	Possible through P-Tech programs or states with flexible graduation requirements. Students can also start in K–12 and finish upon graduation.	Most Associate program graduates go into: - Health care - Technical fields	Depending on the industry, students can earn more than with a bachelor's degree (e.g., IT)

(continued)

Table 7 (*continued*)

	Description	*Industry*	*Value*
		Industry credential	
Industry-based certifications	Skill credentials awarded by an industry certification body.	These fields place the highest value: computer and mathematics.	In some cases, students with industry-based credentials earn as much as those with college degrees. Men with certificates in electronics or computer and information services do as well as their peers with college degrees.
Apprenticeship certifications	Work-based learning combined with intensive coursework. Registered and Youth Apprenticeships.	- Building trades - Manufacturing	Students who complete apprenticeships have higher wages. Not widely used at K–12 level.
Occupational license	Government-issued credential that convey a legal authority to work in an occupation. Must be renewed periodically.	Most occupational license holders work in: - Health care - Education - Business and Office management - Transportation (e.g., truck drivers)	In 2018, earnings for individuals with active occupational licenses were higher than those without one. More valuable for older and more highly educated license holders. Most occupational license holders are male.
		Non-diploma education credential	
Postsecondary certificate	Awarded based on completion of courses and tests. Possible through dual enrollment with a two-year institution. 1 to 4 years to complete.	Degree holders make the most when they work in: - IT - Electronics - Business and Office management Health care and cosmetology are popular, but graduates make more when obtaining other certificates.	When graduates work in the field of their certificate, they earn nearly as much as an associate degree holder. More valuable for male than female certificate holders. Most certificate holders are low-income, making it a pathway out of poverty.
Test-based skill credential	ACT WorkKeys offers tests to assess student career readiness skills.	Assessments gauge career readiness, foundational math and reading, and soft skills.	The tests are easy for schools to administer, and WorkKeys is already used widely in an industry context. It is not clear what it's value is for secondary students.
Micro-credential	MOOCs (Massively Open Online Courses) are online and open access courses.	MOOCs are offered for all industries but the most popular courses are in data science, IT, and programming.	Value not yet understood, although early studies suggest well-educated MOOC participants are more likely to use their credentials to find a new job.

Table 7 (*continued*)

	Description	*Industry*	*Value*
		Other	
Digital Badge	Digital Badges are conferred by industry, civic organizations, the military, and others.	New, impact is unknown. Some question validity and portability. Preliminary survey finds badges indicate higher academic and career motivation.	Digital badges are easy to administer and can be used for a wide variety of industries. Value seems limited to the organizations that confer them. Not clear how transferrable they are.

** This table does not include course completion certificates or military certificates.*

Sources: Counting US Postsecondary and Secondary Credentials (Credential Engine, 2019) and in-text links.

Appendix C: Questions for Policy Analysis

We offer questions to guide policy analysis for each of our recommendations:

1. Coordinate strategy
2. Rethink credentialing
3. Provide consistent information for families and providers
4. Hold providers accountable

Coordinate strategy

Strategic planning and coordination Are state agencies that represent K–12, higher education, and industry involved in developing and monitoring career education strategic goals? Is there a statewide industry intermediary to connect LEAs with industry partners for work-based learning and program support?

Articulation with postsecondary pathways Can postsecondary credit transfer between the community college, technical college, and state college system? Does the state provide guidance to local systems to connect with postsecondary institutions to establish articulation agreements? Are postsecondary systems involved in identifying secondary pathways that align with existing postsecondary degrees and credentials?

Industry alignment Has industry provided input on the general skills needed for career clusters and on cross-sector industry "soft skills" needed in all workplaces? Has industry provided input on industry credentials, certifications, and specialized high school diplomas?

Start-up support Are LEAs given financial support to develop or redesign career education programs? Does the state provide incentives or financial support for work-based learning? Does the state produce guides for LEAs that help them set up career programs?

Funding models Do funding models penalize schools whose students engage in out-of-school learning, such as work-based learning or community-based projects? Are there ways to award funds for demonstrated competence in an exam or for a completed program?

Credit award Is there a seat-time requirement for credit award? Are there ways to award credit for learning that happens outside of classroom learning? What checks are in place to ensure the rigor of student learning?

Rethink Credentialing

Credential alignment Are credentials aligned with what is used and recognized by industry? Is there guidance for schools and systems to know which credentials are used and valued by industry?

Competencies Does the state provide general guidance regarding nonacademic competencies that are valued by cross-sector industries? Does the state provide guidance about the skills and competencies valued by specific career pathways? Are there requirements about how LEAs should assess student competence in soft skills and technical skills?

Graduation pathways If a state has differentiated graduation pathways, what safeguards are in place to make sure students can still pursue postsecondary schooling if they wish? If a state has a competency-based diploma, what safeguards are in place to ensure career pathways are high quality?

Preparation for lifelong learning Are safeguards in place to ensure CTE schools and programs are not offering mediocre academic courses? For example, are there established curricula standards for common courses used within CTE programs, such as applied math and business English?

Provide Consistent Information

Career information Do families, students, and providers have access to information about careers and the job prospects associated with those careers? Is there analysis that schools and systems can easily access to identify national and local demand? What training is needed for success in these careers?

Provider information Do families and students have access to information about all programs that offer career learning to students? Are outcomes reported?

Consistency Are consistent, specific terms used to describe career education programs? Is information regularly updated?

Hold Providers Accountable

Program inclusion in the state accountability system Are part-time programs included in the state accountability system? Are nonschool providers used by schools to award credit included in the accountability system? If not, is there some kind of public reporting for these programs?

Oversight Are CTE schools and programs held accountable for CTE-related measures? Are schools that award diplomas held accountable for math, English, and other subject outcomes? Are nonprofit CTE programs held accountable for student learning? What actions can the state take if programs are not preparing students for career or college?

CTE measures Are there CTE-specific measures in the state accountability system? Are measures aligned with research? Are they reported separately so families and community members can see how schools are doing on specific measures?

Access Do regional CTE centers or state managed CTE schools provide transportation to students? Do they rely on restrictive admissions criteria? How are students with disabilities supported in CTE schools? What guidance does the state provide to local systems regarding access?

NOTES

1 Our analysis of the problems and recommendations are based on a review of research, observation of program implementation across the country (appendix A), and analysis of state graduation requirements (appendix B). We searched the University of Washington library system, Google, and the bibliographies of other research reports. We were guided by the following questions: Which outcomes do CTE impact? Do we find these outcomes for all students and under all conditions? Does enrollment in CTE impact earnings? What do we know about the efficacy of CTE program features?

2 James J. Kemple, "Career Academies: Long-Term Impacts on Work, Education, and Transitions to Adulthood" (New York, NY: MRDC, 2008); Miya T. Warner et al., "Taking Stock of the California Linked Learning District Initiative" (Menlo Park, CA: SRI International, 2016); Shaun M. Dougherty, "The Effect of Career and Technical Education on Human Capital Accumulation: Causal Evidence from Massachusetts," *Education Finance and Policy* 13, no. 2 (Spring 2018): 119–148.

3 Olivia Rice et al., "Connecting Secondary Career and Technical Education and Registered Apprenticeship (Washington, DC: US Department of Education, 2016); "How Massachusetts Vocational Schools Are Preparing Students for College and Careers" (Washington, DC: Achieve, 2016); Michael A. Gottfried and Jay Stratte Plasman, "Linking the Timing of Career and Technical Education Coursetaking With High School Dropout and College-Going Behavior," *American Educational Research Journal* 55, no. 2 (2017): 325–361.

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and Technical Education and Registered Apprenticeship"; Marisa Castellano et al., "Rigorous Tests of Student Outcomes in CTE Programs of Study: Final Report" (Louisville, KY: National Research Center for Career and Technical Education, 2014); Shaun M. Dougherty, "Career and Technical Education in High School: Does It Improve Student Outcomes?" (Washington, DC: Thomas B. Fordham Institute, 2016); Gottfried and Plasman, "Linking the Timing of Career and Technical Education Coursetaking With High School Dropout and College-Going Behavior," 325–361; Jing Sun and Samantha Spinney, Transforming the American High School Experience: NAF's Cohort Graduation Rates from 2011–2015 (Fairfax, VA: ICF International, 2017).

5 Gottfried and Plasman, "Linking the Timing of Career and Technical Education Coursetaking With High School Dropout and College-Going Behavior," 325–361.

6 Kemple, "Career Academies: Long-Term Impacts on Work, Education, and Transitions to Adulthood"; Warner et al., "Taking Stock of the California Linked Learning District Initiative"; Castellano et al., "Rigorous Tests of Student Outcomes in CTE Programs of Study"; Dougherty, "The Effect of Career and Technical Education on Human Capital Accumulation," 119–148; Ruth Curran Neild, Christopher Boccanfuso, and Vaughan Byrnes, "The Academic Impacts of Career and Technical Schools: A Case Study of a Large Urban School District" (Baltimore, MD: Everyone Graduates Center, 2013); Castellano et al., "Rigorous Tests of Student Outcomes in CTE Programs of Study"; Robert Bozick and Benjamin Dalton, "Balancing Career and Technical Education with Academic Coursework: The Consequences for Mathematics Achievement in High School," *Educational Evaluation and Policy Analysis* 35, no. 2 (June 2013): 123–138.

7 Neild, Boccanfuso, and Byrnes, "The Academic Impacts of Career and Technical Schools"; Warner et al., "Taking Stock of the California Linked Learning District Initiative."

8 Dougherty, "Career and Technical Education in High School: Does It Improve Student Outcomes?"; Daniel Kreisman and Kevin Strange, "Vocational and Career Tech Education in American High Schools: The Value of Depth Over Breadth." Working Paper 17-12 (Atlanta, GA: Andrew Young School of Policy Studies, 2017); David Stern, Charles Dayton, and Marilyn Raby, "Career Academies: A Proven Strategy to Prepare High School Students for College and Careers" (Berkeley, CA: Career Academy Support Network, 2010); Kemple, "Career Academies: Long-Term Impacts on Work, Education, and Transitions to Adulthood"; Warner et al., "Taking Stock of the California Linked Learning District Initiative"; Castellano et al., "Rigorous Tests of Student Outcomes in CTE Programs of Study"; Sandra Staklis and Steven Klein, "Technical Skill Attainment and Post-Program Outcomes: An Analysis of Pennsylvania Secondary Career and Technical Education Graduates" (Louisville, KY: National Research Center for Career and Technical Education, 2010).

9 Kemple, "Career Academies: Long-Term Impacts on Work, Education, and Transitions to Adulthood"; Warner et al., "Taking Stock of the California Linked Learning District Initiative"; Castellano et al., "Rigorous Tests of Student Outcomes in CTE Programs of Study"; Dougherty, "The Effect of Career and Technical Education on Human Capital Accumulation," 119–148; Ruth Curran Neild, Christopher Boccanfuso, and Vaughan Byrnes, "The Academic Impacts of Career and Technical Schools: A Case Study of a Large Urban School District" (Baltimore, MD: Everyone Graduates Center, 2013); Castellano et al., "Rigorous Tests of Student Outcomes in CTE Programs of Study"; Robert Bozick and Benjamin Dalton, "Balancing Career and Technical Education with Academic Coursework: The Consequences for Mathematics Achievement in High School," *Educational Evaluation and Policy Analysis* 35, no. 2 (June 2013): 123–138.

10 The National Association of Colleges and Employers (NACE) has identified eight career-readiness competencies. Annual NACE surveys have consistently found critical thinking and problem solving to be the skill ranked most highly by employers.

11 Kevin Hollenbeck, W. E. Upjohn Institute, "State Use of Workforce System Net Impact Estimates and Rates of Return." Presented at the Association for Public Policy Analysis and Management Conference, Los Angeles, California, November 7, 2008; Robert I. Lerman, "Expanding Apprenticeship A Way to Enhance Skills and Careers" (Washington, DC: Urban Institute, 2010); Debbie Reed et al., "An Effectiveness Assessment and Cost-Benefit Analysis of Registered Apprenticeship in 10 States" (Oakland, CA: Mathematica Policy Research, 2012); "2013 Workforce Training Results: Apprenticeship" (Olympia, WA: Workforce Training & Education Coordinating Board, 2013).

12 "National Assessment of Career and Technical Education: Final Report to Congress" (Washington, DC: US Department of Education, 2014); Paul E. Harrington, Neeta P. Fogg, and Christine Shaw, "College Access and Retention of Career and Technical Education Graduates" (Cambridge, MA: Rennie Center for Education Research & Policy, 2017).

13 Resources for work-based learning generally and apprenticeships specifically: Work-based learning policy: 50-state scan; Work-based learning model policy components; Work-based learning toolkit; Work-based learning opportunities for high school students; Promoting work-based learning: Efforts in Connecticut & Kentucky; Work-based learning in California; Making Work-Based Learning Work, Work-Based Learning for Youth at Risk: Getting Employers on Board, Youth apprenticeship: A hopeful approach for improving outcomes for Baltimore youth; Connecting secondary career and technical education and Registered Apprenticeships: A profile of six state systems; District of Columbia Public School system: Youth apprenticeship program.

14 Researcher interview with Colorado Succeeds.

15 The US Department of Health and Human Services set the 2018 federal poverty level at $28,870 for a family of four. Living wage is defined as paying $17 per hour for full-time employees under 45, and $22 for employees over 45, see Table 16 in "Good Jobs that Pay without a BA." The careers that do not need a BA and pay well are, in order of employment: manufacturing, financial/business services, transportation and utilities, wholesale and retail trade, construction, leisure and hospitality, health care, government services, education services, and natural resources.

16 Dougherty, Career and Technical Education in High School; Cameron Sublett David Griffith, How Aligned is Career and Technical Education to Local Labor Markets? (Washington, DC: Thomas B. Fordham Institute, 2019); Kreisman and Strange, "Vocational and Career Tech Education in American High Schools."

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19 The Credential Finder is a searchable database of diploma and non-diploma credentials. It offers a list of known credentials with preliminary information about their value and use.

20 For guidance for how to do this, see Amy Ellen Duke-Benfield et al., Expanding Opportunities: Defining Quality Non-Degree Credentials for States (Washington, DC: National Skills Coalition, 2019).

21 ExcelinEd offers a guide and model policy to support SEAs to conduct audits of career education.

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About the Author

GEORGIA HEYWARD

Georgia Heyward is a research analyst at the Center on Reinventing Public Education (CRPE). Since joining CRPE, she has completed mixed-methods research and policy analysis related to urban school reform strategies, the impact of school choice on families, and the four-day school week in rural communities. Most recently, she has engaged in research on career and technical education (CTE).

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Hoover Institution, Stanford University
434 Galvez Mall
Stanford, CA 94305-6003
650-723-1754

Hoover Institution in Washington
The Johnson Center
1399 New York Avenue NW, Suite 500
Washington, DC 20005
202-760-3200

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