

Innovating for Equity and Excellence:

Recommendations to States for Implementing the Strengthening Career and Technical Education for the 21st Century Act (Perkins V)



Acknowledgments

This report was written by the **Alliance for Excellent Education**, the **Center for American Progress**, **JFF**, the **Learning Policy Institute**, the **Linked Learning Alliance**, **NAF**, and the **National Center for the Improvement of Educational Assessment, Inc.**

The **Alliance for Excellent Education** (All4Ed) is a Washington, DC–based national policy, practice, and advocacy organization dedicated to ensuring that all students, particularly those underperforming and those historically underserved, graduate from high school ready for success in college, work, and citizenship. all4ed.org

The **Center for American Progress** (CAP) is an independent nonpartisan policy institute that is dedicated to improving the lives of all Americans, through bold, progressive ideas, as well as strong leadership and concerted action. CAP's aim is not just to change the conversation, but to change the country. americanprogress.org

JFF is a national nonprofit that drives transformation in the American workforce and education systems. For thirty-five years, JFF has led the way in designing innovative and scalable solutions that create access to economic advancement for all. jff.org

The **Learning Policy Institute** (Institute) conducts and communicates independent, high-quality research to improve education policy and practice. Working with policymakers, researchers, educators, community groups, and others, the Institute seeks to advance evidence-based policies that support empowering and equitable learning for each and every child. Nonprofit and nonpartisan, the Institute connects policymakers and stakeholders at the local, state, and federal levels with the evidence, ideas, and actions needed to strengthen the education system from preschool through college and career readiness. learningpolicyinstitute.org

The **Linked Learning Alliance** (Alliance) serves the coalition of educators, employers, and community organizations dedicated to improving the education system and advancing equity and excellence through expanded access to Linked Learning. The Alliance provides a collective voice for this field, advocates for policies that support the Linked Learning approach, sets the quality standard for Linked Learning in practice, and brings diverse stakeholders together to improve outcomes for students. linkedlearning.org

NAF is a national network of education, business, and community leaders who work together to ensure that high school students are college, career, and future ready. NAF's educational design ignites students' passion for learning and gives businesses the opportunity to shape America's future workforce by transforming the learning environment to include STEM-infused industry-specific curricula and work-based learning experiences, including paid internships. naf.org

The **National Center for the Improvement of Educational Assessment, Inc.** (Center for Assessment), a Dover, NH–based not-for-profit, 501(c)(3) corporation, strives to increase student learning through more meaningful educational assessment and accountability practices. The Center for Assessment engages in deep partnerships with state and district education leaders to design, implement, and evaluate assessment and accountability policies and programs, and to design technically sound policy solutions to support important educational goals. nciea.org

© Alliance for Excellent Education, 2019.



@All4Ed



facebook.com/All4ed

Table of Contents

Introduction	4
Recommendation One: Carry Forward the State’s Vision for College and Career Readiness by Aligning Perkins V with ESSA.	5
Recommendation Two: Prioritize Improving the Performance of Student Subgroups Through the Accountability System and Program Improvement.	11
Recommendation Three: Prioritize High-Quality CTE Programs and Programs of Study Through the Use of Reserve Funds and State Leadership Funds.	13
Appendix 1: Examples of Aligning Perkins V and ESSA Accountability	15
Appendix 2: Examples of High-Quality Work-Based Learning Experiences.	16
Appendix 3: Examples of High-Quality CTE and College and Career Pathways Approaches.	18
Appendix 4: Resources for Integrating CTE Course Work with Rigorous Academic Standards	20
Appendix 5: Examples of High-Quality Performance Assessments	22
Endnotes	23

Introduction

At a time when innovation and flexibility have been lauded and prioritized in federal education policy, the passage of the Strengthening Career and Technical Education for the 21st Century Act (Perkins V) presents a unique opportunity for state education and workforce leaders to explore innovative ways to transform postsecondary outcomes for historically underserved students.

The urgency of the moment is evident. While 80 percent of good-paying jobs require postsecondary education,¹ in 2017 less than 50 percent of Americans between twenty-five and sixty-four years old held a quality credential beyond high school.² The statistics are even more alarming for Americans from historically underserved groups. Only about 24 percent each of Latinos and Native Americans and about 30 percent of African Americans held an associate's degree or higher in 2017.³

Meanwhile, a lack of qualified teachers presents a significant barrier to ensuring that all students have access to high-quality career pathways. In a nationwide listing of teacher shortages in School Year 2017–18, thirty-two states reported a shortage of career and technical education (CTE) educators and more than forty states reported shortages of educators in the science, technology, engineering, and math (STEM) fields.⁴ This data reveals an urgent need to improve and innovate learning opportunities to ensure that more young people, particularly those who historically have been underserved, are prepared for the growing demands of the U.S. economy.

But with urgency comes an exciting opportunity for educators, policymakers, business and industry leaders, and community members to collaborate to deliver on the promise of the new Perkins V law—"to develop more fully the academic knowledge and technical and employability skills of secondary education students and postsecondary education students" who participate in CTE.

As organizations that work with and represent education researchers, policymakers, practitioners, students, business leaders, state and local advocates, and CTE leaders nationwide, **we offer the following recommendations for implementing Perkins V in states:**

1. Align Perkins V with the Every Student Succeeds Act (ESSA).

States should align their college- and career-ready indicators of school quality and student success under ESSA with the program quality indicator required under Perkins V. States also can align efforts to attract, prepare, and retain CTE educators with efforts under Title II of ESSA.

2. Prioritize improving the performance of student subgroups.

States and eligible recipients should implement improvement plans for student subgroups who do not meet state-determined performance levels on the core indicators of performance in the law.

3. Prioritize high-quality CTE programs and programs of study.

States can utilize reserve funds and state leadership funds to implement innovative high-quality, evidence-based CTE programs for students of all backgrounds.

More than 95 percent of all jobs created since the Great Recession have gone to workers with at least some college education.⁵ The reauthorization of key federal laws, including the Workforce Innovation and Opportunity Act, ESSA, and Perkins V, affords states the flexibility to innovate for equity and excellence and close the skill gaps in workforce preparation that currently exist for too many Americans.

The recommendations in this report are grounded in evidence-based programs and promising approaches for preparing students for the twenty-first-century work environment. They provide states with practical guidance for applying Perkins V, with a focus on meeting the needs of historically underserved groups of students.

We encourage states to take full advantage of this unique moment to prioritize equity and quality when implementing Perkins V, utilizing the recommendations and strategies in this resource to engage educators, policymakers, members of the business community, and leaders at institutions of higher education to realize the power and promise of Perkins V for *all* students.

Recommendation One: Carry Forward the State's Vision for College and Career Readiness by Aligning Perkins V with ESSA.

A reauthorized federal CTE law provides states with the unique opportunity to align systems, braid funding, and design policies to support a state's vision for student success and college and career readiness. Perkins V was reauthorized with the unique goal of aligning specific definitions and provisions with ESSA. For Perkins V and ESSA to have the desired impact on student outcomes, the policies, priorities, and goals underlying the design and implementation of these laws must be based on a shared vision for education and student learning within each state. This vision, or theory of action, should outline the state's overarching goals for student learning, the outcomes endorsed by the state representing attainment of or progress toward those goals, and the structure by which the state will achieve those outcomes.

Most states define this vision throughout their ESSA plan. The state vision also is reflected in the procedures used to establish performance goals and identify schools in need of support, and in the business rules that drive the calculation and reporting of system results. Including indicators of college and career readiness can show a state's values and priorities and reflect the activities and interventions the state believes will bring about its desired change in student outcomes. Thirty-nine states and the District of Columbia include information regarding student access to, completion of, and/or performance in a college- and career-ready curriculum in their accountability and improvement systems, and many of these systems focus on students' access to high-quality CTE pathways.⁶ Providing these curricular and experiential learning opportunities requires investing in a qualified educator workforce. When drafting their state Perkins V plans, states should weigh and deliberate the priorities they set under ESSA to determine areas of alignment and areas for revision to ensure that both laws work in concert to prepare all young people for the workforce.

The recommendations offered here outline specific strategies states can use to deliver on a state's vision, by integrating Perkins V and ESSA:

1. Align existing and proposed college- and career-ready indicators of school quality and student success in the state's ESSA plan with program quality indicators under Perkins V.
2. Adopt high-quality CTE pathways and programs of study as a school improvement strategy.

3. Align CTE teacher-quality provisions with teacher-quality provisions under ESSA.
4. Align challenging state academic standards under ESSA with relevant CTE standards.

To deliver on a shared vision for student learning, state directors of CTE should consult with state education agency teams that developed long-term goals and indicators under ESSA to solidify the state's vision of college and career readiness, align the CTE and ESSA systems, and leverage existing data.

See Appendix 1 for additional resources on aligning a state's Perkins V and ESSA accountability systems.

Sub-recommendation One

Align existing and proposed college- and career-ready indicators of school quality and student success in the state's ESSA plan with program quality indicators under Perkins V.

States should consider leveraging their existing ESSA plans when developing their Perkins V plans, particularly when establishing performance levels and selecting a program quality indicator (or indicators) to satisfy the accountability requirements of the law.

The new indicator of program quality in Perkins V requires states to include at least one of the following indicators in their Perkins V state accountability system [see Section 113(b)(2)(A)(iv)]:

- the percentage of CTE concentrators who graduated from high school having attained a recognized postsecondary credential;
- the percentage of CTE concentrators who graduated from high school having attained postsecondary credits in the relevant CTE program of study earned through dual-enrollment or concurrent enrollment or another credit transfer agreement; or
- the percentage of CTE concentrators who graduated from high school having participated in work-based learning.

When developing their ESSA state plans, thirty-nine states and the District of Columbia included college- and career-ready measures as part of their school quality and student success (SQSS) indicator.⁷ An analysis conducted by the Alliance for Excellent Education reveals alignment between the existing SQSS measures in state ESSA plans and many of the performance indicators required under Perkins V. (See figure 1 below.)

Both ESSA and Perkins V require states to track the four-year adjusted cohort graduation rate and student proficiency in English language arts and mathematics. Consequently, these requirements align in all fifty states, the District of Columbia, and Puerto Rico, as figure 1 indicates. Multiple states also demonstrate alignment between their ESSA college- and career-ready measures and other Perkins V indicators of performance:

- Twenty-one states include attainment of a recognized postsecondary credential in high school as part of the SQSS indicator in their ESSA state plan.
- Thirty-three states include the attainment of postsecondary credits in a relevant CTE program or program of study (or similar measure) in their ESSA state plan.

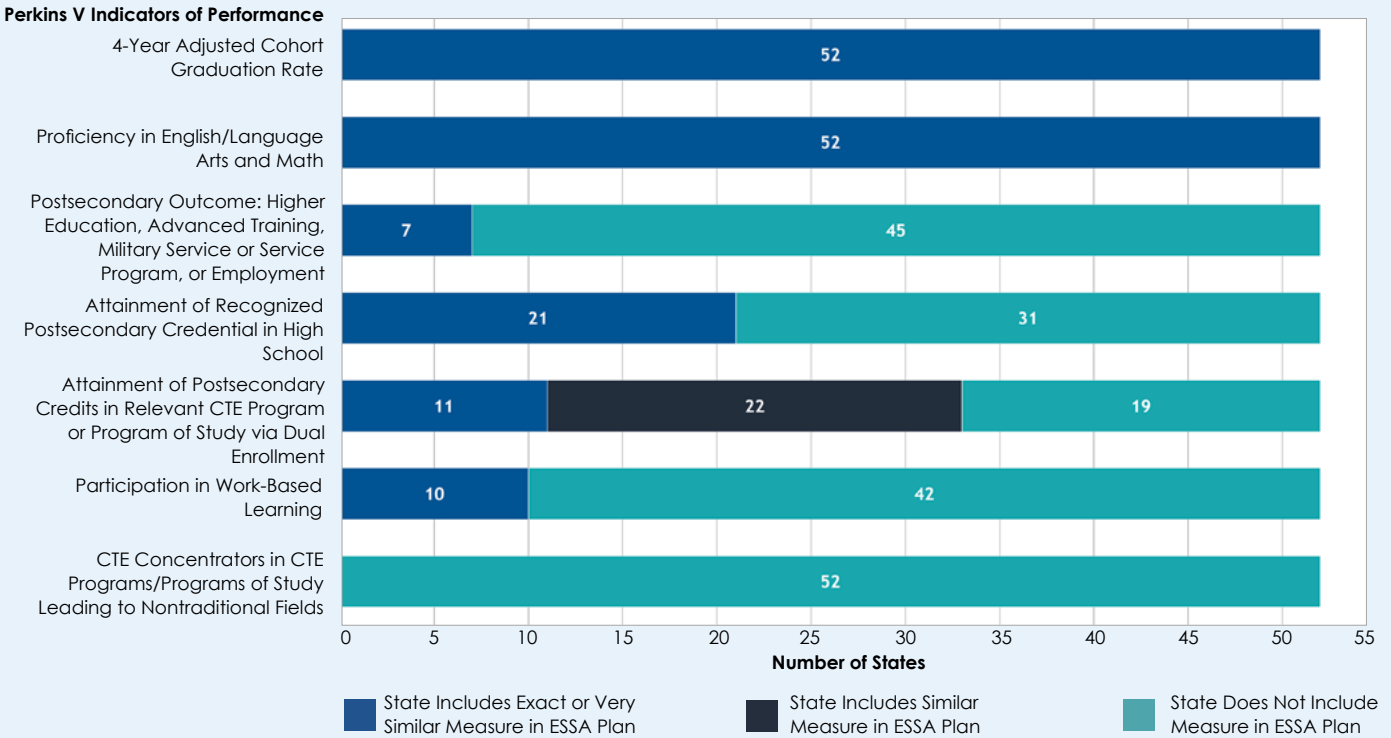
- Ten states include a measure of students participating in work-based learning in their ESSA state plans.

Given this existing alignment, states should collaborate across ESSA and CTE departments to build on the work already under way to align measures of college and career readiness.

Adopting High-Quality Program Quality Indicators

In addition to aligning their accountability requirements under ESSA and Perkins, **states should consider gradually adopting all three measures of program quality under Perkins V.** Eligible agencies have the option of selecting one, two, or all three program quality indicators outlined in Section 113(b)(2)(A)(iv) of Perkins V to include in the state's accountability system. A high-quality CTE program or college and career pathways approach should provide high school students with *all three opportunities* outlined in the indicators of program quality: (1) complete postsecondary credits through dual-enrollment course work; (2) earn a recognized postsecondary credential; and (3) participate in a high-quality work-based learning experience.

FIGURE 1: Alignment of ESSA College- and Career-Ready Indicators with Perkins V Indicators of Performance



Source: 2019 analysis conducted by the Alliance for Excellent Education
Note: The analysis depicted in the graph includes information drawn from the ESSA state plans of all fifty states, the District of Columbia, and Puerto Rico

See Appendix 2 for examples of high-quality work-based learning experiences.

States May Select “Any Other Measure” of Student Success

In addition to the three measures of program quality mentioned previously, states can adopt “any other measure of student success that is statewide, valid, and reliable, and comparable across the State” [Section 113(b)(2)(A)(iv)(II)]. **When deciding whether to use “any other measure” of student success, states should consider the following:**

1. Use existing ESSA SQSS measures that emphasize broad aspects of college and career readiness, such as enrolling in and completing Advanced Placement or International Baccalaureate course work.
2. Create measures that examine outcomes for racial/ethnic student subgroups and special populations for each of Perkins V’s three program quality indicators. For example, one measure could track the percentage of students by subgroup who graduate high school having attained any of the three measures of program quality.
3. Emphasize completion of a rigorous, high-quality CTE program of study or college and career pathway. For example, create an indicator for the percentage of CTE concentrators who complete a high-quality CTE program/program of study/college and career pathway or the percentage of CTE concentrators who graduate with a CTE diploma or a CTE endorsement.

Sub-recommendation Two

Adopt high-quality college and career pathways and programs of study as a school improvement strategy under ESSA.

The 2015 passage of ESSA placed responsibility on states to improve low-performing high schools. ESSA requires states to identify their lowest-performing 5 percent of Title I schools for improvement and identify each high school that has a graduation rate at or below 67 percent for comprehensive support and improvement.

While the law specifies which high schools states must identify for support, it is quite flexible regarding the improvement strategies

states and districts must use in these schools. For example, strategies must be based on a school-level needs assessment and include evidence-based interventions [ESSA, Section 1111(d)(1)(B)]; however, states and districts have the authority to implement the strategies they determine will support students most effectively. This flexibility presents an important opportunity to implement high-quality college and career pathways and programs of study as a school improvement strategy under ESSA. States can accomplish this by including high-quality college and career pathways on approved intervention lists, connecting districts with vetted technical assistance providers who specialize in integrating academics and CTE, and engaging school districts with low-performing high schools in technical assistance opportunities made available under Perkins V.

See Appendix 3 for examples of high-quality college and career pathways approaches.

Sub-recommendation Three

Align Perkins V teacher-quality provisions with teacher-quality provisions under ESSA.

Currently, thirty-two states report a shortage of CTE teachers, which can be related to pipeline, preparation, and retention issues.⁸ These shortages present a barrier to ensuring that all students have access to high-quality CTE programs led by skilled and effective CTE educators. Perkins V offers an opportunity for states to eliminate barriers to improving CTE teaching and learning by supporting promising strategies to attract, develop, and retain CTE educators.⁹ Implementing Perkins V also presents an opportunity to align these teacher recruitment and retention efforts with state efforts under ESSA to increase student access to high-quality CTE pathways, which requires an effective CTE educator workforce.

ESSA authorizes Title II funds to support effective instruction. States can use these funds to support district efforts to recruit, prepare, and enhance the skills of CTE teachers through programs such as a CTE teacher residency, collaborative professional development opportunities, and high-quality induction and mentoring programs. Complementing these programs, Perkins V requires eligible recipients to describe their teacher recruitment, preparation, retention, and training activities in their local application, focusing on attracting underrepresented groups

to the teaching profession and preparing them to become educators.

To support these efforts, states can use funding under Perkins V for the following purposes:

1. Provide financial incentives and additional supports for individuals with industry or educational backgrounds to become certified as CTE teachers, particularly in STEM-related fields.
2. Create or expand recruitment and retention efforts through professional development, curricular and pedagogical support, peer mentoring, and externships with businesses.
3. Provide training for teachers and counselors to increase their understanding and ability to communicate current CTE career opportunities and employment trends to students.
4. Incentivize CTE teachers to earn industry- or sector-specific certifications and credentials, such as in the STEM fields or other in-demand industry sectors or occupations.
5. Improve and diversify the pipeline of educators into the CTE teaching profession by underwriting preparation for individuals from both industry and academic backgrounds, particularly in subject-area shortage fields.

A number of states already are advancing state-level strategies that could be funded with a combination of ESSA and Perkins V funds to address teacher shortages broadly and improve educator quality:¹⁰

1. **Improving teacher preparation and reducing costs to enter the profession.** New York offers a CTE teacher residency program called the Success Via Apprenticeship Program that offers a paid teaching internship, industry work experience, and post-academic study to program candidates.¹¹ This program is consistent with research that shows that high-quality teacher preparation programs that include a residency component can successfully recruit teachers, especially teachers of color, to high-need districts and yield above-average retention rates.¹²
2. **Strengthening school and district hiring practices and personnel management.** Tennessee approved rule changes to the Practitioner Occupational Education License to provide more flexibility to applicants by counting industry experience toward higher education degrees.¹³ Additionally,

Tennessee enacted an incentive program allowing midcareer professionals' work experience to count toward teaching experience for salary purposes.¹⁴ Virginia offers a provisional license to CTE teachers who do not hold industry certification credentials in their respective content areas and who are seeking an initial teaching license. The provisional license allows extra time to acquire necessary credentials and help recruit and retain educators.¹⁵

3. **Increasing teacher compensation.** Alabama and Tennessee offer various financial incentives for CTE teachers, including allowing industry experts to apply professional experience toward their years of teaching for salary purposes and providing statewide grants to supplement certain career-sector salaries.¹⁶ These policies align with research that shows that teachers are more likely to stay at their schools when their wages increase and are comparable with job opportunities in other industries and in nearby school districts.¹⁷
4. **Providing quality mentoring and induction for beginning teachers.** Alaska, which often deals with single educator-led CTE programs in rural districts, made a concerted effort starting in 2010 to recruit, train, and retain teachers through professional development and mentoring programs and to strengthen Regional Training Centers.¹⁸ This program, a joint effort between the Alaska Department of Education and Early Development and the Alaska Department of Labor and Workforce Development, includes strategic partnerships with industry experts, educator development and CTE organizations, and the University of Alaska system to provide professional development training, credentialing, and increased leadership development for CTE teachers. In addition, research shows that similar induction programs that include being assigned a mentor and meeting frequently result in improved teacher retention.¹⁹
5. **Providing high-quality professional development.** Ohio provides state funding based on the demand for industry-specific jobs, with 25 percent of the funding used directly for personnel expenditures and 75 percent directed toward educator needs, such as curriculum development, work-based experiences, and instructional resources for teachers.²⁰ States should pair these types of supports with sufficient teaching resources, strong instructional leadership, and time for collaboration and planning, including joint professional development between CTE and non-CTE teachers to improve program coordination and collaboration across

subjects—approaches that are associated with improving teacher retention.²¹ Evidence suggests that high-quality professional development that can help teachers learn and refine the pedagogies required to teach twenty-first-century skills (a) is content focused; (b) incorporates active learning; (c) supports collaboration; (d) uses models of effective practice; (e) provides coaching and expert support; (f) offers feedback and reflection; and (g) is of sustained duration.

Sub-recommendation Four

Align challenging state academic standards under ESSA with relevant CTE standards.

Both ESSA and Perkins V call for greater alignment of academic and CTE learning. Specifically, both laws call for alignment of standards and curricular strategies, and Perkins V calls out the need to assess the reading and math skills of CTE students. Additionally, both laws allow program funding to be used to

- align states' relevant CTE standards with their rigorous math and reading standards at both the state and district levels; and
- implement high-quality college- and career-ready assessments.

States can use ESSA and Perkins V funds to develop the structures and practices that districts and schools can employ to better integrate academic standards and CTE curricula. Below are recommendations, examples, and related resources to support this alignment of standards.

Align CTE with Math and Reading Standards

States should align relevant CTE standards with their rigorous math and reading standards at both the state and district levels.

Practice finds that the integration of academic standards and curricula with CTE can yield several [benefits](#), such as the ability to

- enhance student engagement through active, problem solving-based learning;
- promote identification of specific skills gaps through project-based assessments;

- support students in effective career planning;
- demonstrate relevance of academic learning to students from a wide variety of backgrounds; and
- build community support from higher education and local industry partners.

States typically revise their academic standards every five to six years. As states engage in this process, it is a perfect time to consider how to integrate those standards with specific CTE standards or generalized employability skills. Apart from the state-level standards revision process, districts and schools also can compare their academic and CTE standards to identify where subjects can reinforce each other, integrate academic content into CTE, and integrate CTE into academic content.

See Appendix 4 for additional resources on integrating CTE course work with rigorous academic courses.

College- and Career-Ready Assessments

States should implement high-quality college- and career-ready assessments. High-quality CTE combines rigorous academics, technical skill development, and real-world assessment. It follows that authentic and high-quality assessments within CTE would address each of these areas.

For example, the Association for Career and Technical Education (ACTE) includes [student assessment](#) within CTE as a pillar in its twelve elements of high-quality CTE. The ACTE [Quality CTE Program of Study Framework](#) links to several guides and research-based approaches that measure the competencies and skills associated with high-quality CTE programs of study. It also addresses incorporating industry-recognized certification exams and general career-readiness assessments into these programs of study.

In addition, ESSA permits student academic assessments to be partially delivered in the form of portfolios, projects, or extended-performance tasks. Perkins V implementation can build on this by delivering a holistic suite of assessments that allow students to contextualize their learning by applying and demonstrating their academic, technical, and employability skills. A 2018 Center for American Progress [report](#) discusses building systems of alternative accountability for high schools that serve students who are overage and undercredited. The report discusses

in detail how to generate an accountability indicator for multiple performance-based and standardized test-based assessment modes. States can use this resource to consider how to incorporate student performance on CTE and academic assessments in their accountability systems.

See Appendix 5 for examples of high-quality performance assessments.



Photo by Allison Shelley/The Verbatim Agency for **American Education: Images of Teachers and Students in Action**

Recommendation Two: Prioritize Improving the Performance of Student Subgroups Through the Accountability System and Program Improvement.

Previous authorizations of the Carl D. Perkins Career and Technical Education Act did not require states to set specific goals or targets for student subgroups when setting state-determined levels of student performance. This led to a federal accountability system that is limited to measuring and improving the performance of students in the aggregate, negating the improvement of student subgroups.

Perkins V includes a new provision that requires eligible agencies and eligible recipients to “continually make meaningful progress toward improving the performance of all career and technical education students, including the subgroups of students described in section 1111(h)(1)(C)(ii) of the Elementary and Secondary Education Act of 1965” [see Sections 113(b)(3)(A)(i)(III)(bb) and 113(b)(4)(A)(i)(III)].

What Is an Eligible Agency or Recipient?

The term “**eligible agency**” refers to a state board designated as the sole state agency responsible for overseeing CTE in the state.

The term “**eligible recipient**” refers to a local educational agency (LEA), including a public charter school that operates as an LEA; an area CTE school; an educational service agency; an Indian tribe, tribal organization, tribal educational agency, or consortium; or a consortium of eligible recipients.

This new provision provides an opportunity for states to be proactive, rather than reactive, in meeting the equity requirements of the law. The accountability provisions in Perkins V are intended to work in concert with other equity-focused provisions, including its requirements under Sections 113(b)(3)(C)(ii)(II) and 113(b)(4)(B)(ii)(II) pertaining to the reporting of disparities or gaps in performance between subgroups or special populations and all CTE concentrators, as well as the requirements under Sections 123(a)(1) and 123(b)(2) for improvement plans to address these gaps.

We recommend that states describe, in their Perkins V state plans, specific strategies for how eligible agencies and eligible recipients will account for the performance of student subgroups and special populations in their state-determined performance levels for the core indicators of performance. Additionally, we recommend that eligible agencies and eligible recipients implement improvement plans for student subgroups that fail to meet at least 90 percent of the state-determined levels of performance for the performance indicators required under the law.

Improvement Plans for Student Subgroups

Perkins V requires eligible agencies and eligible recipients to implement an improvement plan if a state or an eligible recipient fails to meet at least 90 percent of the performance level for any of the indicators of performance for *all* CTE concentrators. Additionally, when developing and implementing an improvement plan, eligible agencies and eligible recipients must “include an analysis of the performance disparities or gaps identified . . . and actions that will be taken to address such gaps” [Sections 123(a)(1) and 123(b)(2)]. In order to make continuous and meaningful progress toward improving the performance of student subgroups, which includes closing performance gaps, eligible agencies and eligible recipients can implement an improvement plan specifically for CTE concentrator student subgroups that are not meeting at least 90 percent of the state-determined level of performance for any indicator of performance.

For instance, if a state or eligible recipient fails to meet at least 90 percent of the performance level for the state-selected *program quality* indicator for a specific student subgroup (based on annual performance data), a state or eligible entity could implement an improvement plan for the student subgroup(s) with the largest gaps in performance first. The state could target state leadership funds—and the local Perkins V allocation for eligible entities and/or reserve funds—specifically to improve the performance of the individual student subgroups on the lagging indicator.

The state of New Jersey, for example, requires eligible recipients to dedicate Perkins V funds toward student subgroups that fail to meet specific performance levels before using those funds for equipment and other priorities. Other states can take this same approach with student subgroups and special populations intentionally to close achievement gaps for historically underserved students, as required under the law, and describe their specific strategy in their state Perkins V plan.

Similarly, Tennessee has implemented an approach within the Perkins V Improvement Plan design process across its postsecondary campuses. Two of the multiple options from the state are (1) to withhold funds from postsecondary campuses that are not meeting student subgroup goals or (2) to require postsecondary eligible recipients to apply a percentage of their Perkins V allocation directly toward improving the student subgroup goals. Under Perkins V, each postsecondary campus in Tennessee now is required to have a minimum of two goals in its local application. One of these goals must focus on either

- improving performance and preparing students for nontraditional fields;
- eliminating gaps for specific student subgroups;
- increasing work-based learning opportunities; or
- implementing new programs of study.

Additional Considerations

A large body of research shows that students have differing access to high-quality CTE programs that can lead to skilled employment in the modern economy.²² Research also finds that schools serving African American, Latino, and Native American students are “bottom heavy”—that is, they offer fewer academic courses or high-end CTE options and more remedial and vocational course training for low-status occupations.²³ Resources and supports need to be distributed equitably for student success. This requires purposeful and targeted efforts, particularly for historically underserved students, including, among other efforts, providing comprehensive and integrated student support services (ISSS).

ISSS are school-based approaches to promoting students' academic success by developing or securing and coordinating supports that target academic factors and other factors that contribute to student achievement.²⁴ Medical care, dental services, mental health supports, tutoring, mentoring, resources for families, housing assistance, and nutrition programs are all examples of ISSS.²⁵ Research shows that students benefit from receiving these school-based interventions, but ISSS are particularly impactful for historically underserved students, many of whom attend low-performing schools designated for support and improvement under ESSA and statewide accountability plans.²⁶

States and eligible recipients can expand CTE opportunities for historically underserved students and special populations in the following ways:

1. Review district- and school-level data to identify gaps in student access to and completion of high-quality CTE experiences, target efforts to increase students' curricular opportunities, and provide additional resources and supports as needed.
2. Use the maximum amount of 2 percent of funds allowed under Section 112(a)(2)(A) for CTE programs in juvenile justice settings.²⁷
3. Review and respond to outcome and demographic data for CTE participants that can be compared against CTE concentrators to analyze access and outcomes between these distinct groups.
4. Identify available ISSS and target those services to schools with gaps in student access and completion, including services that support the successful transition into postsecondary education and the workforce.

See the section “Reserve Funds” under Recommendation Three (page 14) for additional information about how states can leverage Perkins V reserve funds to close disparities or gaps in performance between student subgroups.

Recommendation Three: Prioritize High-Quality CTE Programs and Programs of Study Through the Use of Reserve Funds and State Leadership Funds.

A recent literature review suggests that CTE course work alone does not affect student outcomes as much as CTE course work combined with college preparatory course work, work-based learning, and ISSS.²⁸ A high-quality CTE program integrates rigorous core academic course work with CTE course work. It also includes partnerships with local colleges and employers who inform the development of programs of study and provide work-based learning opportunities and ISSS woven throughout the program of study from high school through college.

This requires a successfully integrated system at the local level, undergirded by a well-designed statewide infrastructure and supportive state and federal policies.

There are many examples of work being done in the field to scale high-quality CTE implementation, including the following:

- 1. The **Pathways to Prosperity Network** works with state and regional leaders to develop and scale college and career pathways through cross-sector partnerships that include K–12, postsecondary education, business and industry, and state and local policymakers.
- 2. The **Linked Learning** approach integrates college-preparatory academic content with rigorous CTE, work-based learning, and comprehensive student supports to deliver real-world learning through industry-themed pathways at the secondary level.
- 3. The **NAF academies** are small learning communities within traditional high schools that feature one of five career clusters, with curricula informed by industry professionals.

See Appendix 3 for more information about these approaches.

Perkins V offers states significant latitude to prioritize the implementation of high-quality CTE programs and college and career pathways systems to ensure that more students have access to aligned secondary and postsecondary programs of study that lead to high-skill, high-wage, in-demand careers. To facilitate high-quality implementation across the state, eligible

agencies can utilize two funding streams to support this work: **state leadership funds** and **reserve funds**. (See "Types of Perkins V Funding" below for more information.) The sections that follow list the activities states can pursue through these funding streams.

Types of Perkins V Funding

State leadership funds: An eligible agency can use up to 10 percent of its annual Perkins V allotment to conduct state leadership activities that support the expansion and implementation of a state's vision for CTE implementation.

Reserve funds: An eligible agency may reserve up to 15 percent of its Perkins V allocation designated for local CTE implementation to award as grants to eligible recipients.

State Leadership Funds

The following are specific activities listed as permissible uses for state leadership funds under the law (see Section 124):

- 1. Establishing statewide industry or sector partnerships between local educational agencies, institutions of higher education, adult education providers, Indian tribes, employers, and parents to (a) develop and implement programs of study and (b) facilitate opportunities for secondary education students to complete integrated CTE and academic course work, earn postsecondary credentials and postsecondary credit through dual or concurrent enrollment or early-college high school at no cost to the student or the student's family, and participate in work-based learning experiences.
- 2. Supporting eligible recipients with eliminating inequities in student access to high-quality programs of study and effective teachers.
- 3. Partnering with qualified intermediaries to improve training, capacity building, and the scalability of high-quality CTE.
- 4. Improving career guidance and academic counseling programs that aid students in making informed decisions.

5. Developing valid and reliable assessments of competencies and technical skills, and enhancing data systems to collect and analyze secondary and postsecondary data and employment outcomes.
6. Other activities listed in this section of the law.

Reserve Funds

Historically, reserve funds were prioritized for rural areas and locations with high concentrations of CTE students. Perkins V, however, now allows states to use this funding to provide additional resources and supports to areas with disparities or performance gaps on state-determined performance levels. This provides another opportunity for states to address long-time disparities or gaps in performance between all CTE

concentrators and racial/ethnic subgroups or special populations.

Perkins V increases the amount states may reserve for innovation at the local level from 10 percent to 15 percent of their Perkins V allocation. Specifically, states can issue grants to eligible recipients²⁹ to promote

- promising and proven CTE programs, practices, and strategies; and
- the development, implementation, and adoption of CTE programs of study or career pathways that align with in-demand sectors and occupations.



Photo by Allison Shelley/The Verbatim Agency for American Education: Images of Teachers and Students in Action

Appendix 1: Examples of Aligning Perkins V and ESSA Accountability

To deliver on a shared vision of preparing all students for the growing economy, states can and should leverage opportunities to align their accountability systems under Perkins V and ESSA, with a focus on closing performance gaps between historically underserved students and their peers by increasing access to high-quality CTE programs. States can accomplish this by

- improving the coherence of a state's accountability system and promoting collaboration across departments during the development of the state's vision for student learning and student outcomes; and
- providing innovative performance-based assessments that measure both academic skills and twenty-first-century competencies that identify a student's postsecondary readiness.

Center for Assessment

The Center for Assessment report [*Designing a Coherent State System of Accountability: The Every Student Succeeds Act and Perkins V*](#) outlines ten steps states can take to promote coherence across a state's plans for accountability under ESSA and Perkins V. To provide for a coherent system of accountability, states must develop their vision for learning through a collaborative process that allows shared components to be represented consistently during system design and implementation.

The report's recommendations are organized around three required "coherence factors":

1. **Clarity** around the state's goals, priorities, and vision for student learning.
2. **Consistency** across common structural elements in service to the shared goal(s) and vision for student learning.
3. **Collaboration** among state and local leaders in K–12, CTE, and the workforce to ensure that each state plan supports progress toward the shared goal and vision for student learning.

Together these recommendations outline a strategy states can use to improve communication and establish accountability provisions under ESSA and Perkins V that work together to provide K–12, higher education, employers, and other leaders with consistent information about progress toward desired student outcomes.

The College and Career Readiness and Success Center: American Institutes for Research

[*Developing a College- and Career-Ready Workforce: An Analysis of ESSA, Perkins V, IDEA, and WIOA*](#), by the American Institutes for Research, helps states facilitate conversations on developing a coherent education-to-career pipeline. The report provides a common framework for identifying opportunities to align college- and career-readiness efforts through a qualitative analysis of the four laws: ESSA, Perkins V, the Individuals with Disabilities Education Act (IDEA), and the Workforce Innovation and Opportunity Act (WIOA). The analysis utilizes an original organizing framework that defines the elements that impact a student's college and career readiness across four domains:

1. **Goals and Expectations** defines the academic, technical, and employability skills students must know and demonstrate to be college and career ready.
2. **Outcomes and Measures** identifies the assessments and indicators that define when students meet the academic, technical, and employability skills defined in Goals and Expectations.
3. **Resources and Structures** defines the nonlearner structure and resource needs, including fiscal, human capital, programmatic, and community needs.
4. **Pathways and Supports** defines the guidance and services needed to develop individual college and career readiness.

Appendix 2: Examples of High-Quality Work-Based Learning Experiences

NAF APPROACH to WORK-BASED LEARNING



NAF academy students complete an intentional sequence of work-based learning experiences which prepares them to make informed college and career choices and allows them to acquire necessary college- and career- readiness skills.

NAF DEFINITION OF WORK-BASED LEARNING

Work-based learning is an instructional strategy that:

- Connects what students are learning in class with the world of work
- Involves interaction with business partners
- Provides students with career awareness, career exploration, and career preparation
- Includes a continuum of experiences
- Aligns with intentional student learning outcomes
- Prepares students for success in post-secondary education and careers
- Benefits the student, the business partner, and the high school

Students complete assignments before, during, and after work-based learning experiences to help them connect their experiences to their academy courses, as well as to their own college and career options.

NAF work-based learning is defined by specific characteristics and is mutually beneficial to the student and the employer.

Over NAF’s 32 year history, best practices for seven work-based learning experiences have been used across the national network. NAF promotes the use of these seven best practice work-based learning experiences, and variances of them in academies.

NAF CONTINUUM OF WORK-BASED LEARNING

Awareness	Exploration	Preparation
<ul style="list-style-type: none">• Guest Speaker• Worksite Tour• Career Fair	<ul style="list-style-type: none">• Informational Interview• Job Shadow• Mock Interview	<ul style="list-style-type: none">• Paid Internship

COPYRIGHT © 2015. ALL RIGHTS RESERVED. JULY 2015

NAF CHARACTERISTICS of WORK-BASED LEARNING



NAF academy students complete an intentional sequence of work-based learning experiences which prepares them to make informed college and career choices and allows them to acquire necessary college- and career- readiness skills.

The following are characteristics for each work-based learning category:

AWARENESS

- Builds student awareness of a variety of careers by exposing students to business partners from outside the school (in-person or virtual)
- Allows students to begin identifying areas of career interest
- Allows students to observe, receive information, and ask questions to acquire knowledge and awareness.
- Relates school with the world of work by connecting careers to academy and post-secondary education.
- Can include classroom projects which mimic projects undertaken in workplace

EXPLORATION

- Includes direct, two-way interactions (in-person or virtual) interaction with industry or community partners
- Exposes students to the range of occupations within an industry, and the skills and education requirements needed for these jobs
- Provides relevancy to core academic and academy courses in their academies.
- Connects to students' existing interests and strengths, helping them refine their areas of interest, and allows students to identify new or different interests in order to explore careers more deeply
- Prepares students with the basic skills necessary for higher intensity work-based learning experiences such as internships

PREPARATION

- Includes one-on-one, two-way interactions with business partners over an extended period of time sufficient for students to be evaluated by professionals using industry standards
- Allows students to apply learning through practical experiences that have value and consequences beyond the classroom
- Empowers students to produce valuable work that furthers the partner organization's goals

INTERNSHIPS SPECIFICALLY:

- Represent culminating work-based learning experience for all NAF students
- Allow students to apply work-readiness and academic skills, as well as learn specific occupational skills in a workplace setting
- Provide an authentic work experience by paying students for their work
- Occur during 11th or 12th grade years, most typically during the summer between the 11th and 12th grade



COPYRIGHT © 2015. ALL RIGHTS RESERVED. JULY 2015

Appendix 3: Examples of High-Quality CTE and College and Career Pathways Approaches

The following are approaches to implementing and scaling high-quality college and career pathways with CTE as the nucleus for school improvement. These approaches represent strategies at the school, district, and state levels and span from whole-school reform to system- and sector-wide reform. Perkins V provides the opportunity to implement these strategies with fidelity and a commitment to equity and excellence.

Pathways to Prosperity Network

The Pathways to Prosperity Network (the Network) develops, implements, and scales systems of high-quality college and career pathways to improve educational and workforce outcomes, expand economic opportunity for all young people and meet regional talent needs. The approach depends on cross-sector partnerships and mobilizes K–12 and postsecondary education leaders, policymakers, and employers, bringing together diverse stakeholders to build a future that works.

The Pathways to Prosperity Network is a collaboration of JFF (Jobs for the Future), the Harvard Graduate School of Education, and states and regions. Five key implementation levers guide the work of state and regional pathways systems:

1. Integrated college and career pathways for grades nine to fourteen.
2. Career information and advising systems.
3. Intermediary organizations that serve as connectors within pathways ecosystems.
4. Effective leadership and enabling policies.
5. Employer engagement and work-based learning.

Currently, fourteen states are part of the Network, working to create and sustain strong college and career pathways for students. As an example of the impact this work can have in states, Delaware has tracked its state's progress in student enrollment in pathways and preparedness for continuing education or the workforce since joining the Network. In 2014, when this work began, Delaware had twenty-eight students in one advanced manufacturing pathway. The state is on track

to have 20,000 students—*half of its high school students*—in high-quality pathways aligned to in-demand careers by 2020. The core of Delaware's CTE pathways success is its strong partnerships across public and private entities, with shared strategies and goals that are co-created and co-owned across K–12, higher education, workforce development, labor, economic development, the office of the governor, the United Way, the Rodel Foundation, and statewide employers. For more information about Delaware's strategic plan and success, visit delawarepathways.org. To learn more about the Network, visit ptopnetwork.org.

Linked Learning

Linked Learning is an educational approach to high school reform that transforms the traditional high school experience. Linked Learning can be offered at the high school level at district schools, charter schools, and regional occupational programs. Linked Learning students follow personally relevant, industry-themed pathways in a wide range of fields. Regardless of the setting, the following characteristics are necessary for success:

- a rigorous, multiyear program of study that integrates college preparatory academic content with technical skill mastery to ensure that students are college and career ready upon graduation;
- strong connections to postsecondary institutions to ensure a smooth transition after graduation;
- trained and motivated teachers and school leaders who adeptly infuse twenty-first-century skill development into their curriculum;
- district and site leaders who understand and champion the pathway structure and effectively support implementation by site and region; and
- productive partnerships with local industry and business to inform curriculum development and support work-based learning.

A recent [evaluation](#) of the Linked Learning approach reports the following outcomes:

- On average, Linked Learning certified pathway students are less likely to drop out of high school and more likely to graduate than their peers in traditional high schools.
- Compared to peers, Linked Learning students are more likely to report a counselor or other adult encouraging them to pursue postsecondary education opportunities.
- Linked Learning students report higher job quality (i.e., employment with paid vacations and sick time and health insurance) than their traditional high school peers.

Visit linkedlearning.org to learn more.

NAF Academies

NAF is a national network of education, business, and community leaders working to bridge the growing “skills gap” between young adults and high-skilled (and higher-wage) employment. NAF aims to achieve this through implementation of NAF academies, which are small learning communities within traditional high schools. Each NAF academy features one of five career clusters: finance; hospitality and tourism; information technology; engineering; and health sciences. NAF curricula are created in partnership with industry professionals and designed to help students acquire valuable workplace skills.

NAF employs [NAFTrack](#) Certification, which uses a multimethod approach to assess the college and career readiness of participating NAF students. Student performance is measured in three areas: career-related course work, performance on a qualifying internship, and high school graduation. Students who successfully complete NAFTrack Certification are prioritized in the hiring process among several major corporations.

A recent [evaluation](#) of NAF academies reports the following outcomes:

- NAF students were 2.9 percentage points more likely to graduate high school on time than their non-NAF peers.
- On-time graduation rates are strong for NAF Latino students (4.2 percentage points higher than rates for non-NAF Latino students) and NAF students who receive free or reduced-price lunch (4.6 percentage points higher than rates for non-NAF students who receive free or reduced-price lunch).
- On-time graduation rates among African American NAF students are 1.7 percentage points higher than those for their non-NAF peers.
- Finance students have the highest graduation rates by career theme (85.4 percent), followed by students in health sciences (83.5 percent), engineering (80 percent), information technology (77.7 percent), and hospitality and tourism (72.7 percent).

Visit naf.org to learn more.

Appendix 4: Resources for Integrating CTE Course Work with Rigorous Academic Standards

The following resources and approaches can be considered for states and districts looking for exemplars and guidance on integrating rigorous academic and CTE course work to deliver an integrated approach to college and career readiness through Perkins V implementation.

Integrating the Common Core State Standards and States' CTE Standards

In 2012, Achieve developed [Common Core State Standards & Career and Technical Education: Bridging the Divide Between College and Career Readiness](#). The guide outlines eight steps that states have taken when considering the integration of the Common Core State Standards (CCSS) (or states' other college- and career-ready standards) with their CTE standards:

1. Developing a common understanding (or definition) of college and career readiness.
2. Forming cross-disciplinary teams for standards planning and implementation.
3. Planning communications and information sharing.
4. Creating (or updating) curricular and instructional resources.
5. Enhancing literacy and math strategies within CTE instruction.
6. Fostering CTE and academic teacher collaboration.
7. Establishing expectations for and monitoring CTE and academic standards integration.
8. Involving postsecondary CTE in academic standards implementation.

Aligning Academic and CTE Standards or Curriculum at the Local Level

ConnectEd: The National Center for College and Career developed its resource [Designing Multidisciplinary Integrated Curriculum Units](#) to guide practitioners at the local level. The resource highlights an eleven-step process for schools and programs that spans planning, developing, and implementing a career-focused high school curriculum that also focuses on rigorous, standards-based instruction.

Colorado's Integration of the CCSS and CTE Standards

Colorado's Senate Bill 08-212 required districts to align their CTE standards with their pre-K–12 standards, as appropriate. The state engaged in this process for its [CTE standards](#) in the following content areas: agriculture, natural resources, and energy; business and marketing; family and consumer sciences; health; science, technology, engineering, and mathematics; arts and information technology; trades and industry; and alternative cooperative education.

Integrating Math and CTE Standards: The Math-in-CTE Model

The National Research Center for Career and Technical Education conducted a study of the [Math-in-CTE](#) model that embeds mathematical concepts into CTE courses through curriculum mapping, a pedagogical framework, and educator professional development. Instructors use self-developed math-enhanced CTE lessons based on a seven-component pedagogical framework. Students in the Math-in-CTE model outperformed on math compared to those without the program and retained critical technical skills.

Addressing the Relevance of Academic Instruction for Postsecondary Pathways: Math Pathways

In addition to making math and reading more relevant for CTE students specifically, practitioners in the field have been rethinking math instruction so that it is more relevant for all postsecondary and career pathways. Traditional postsecondary math instruction is a significant barrier to completing a postsecondary degree. The [Charles A. Dana Center at The University of Texas at Austin](#) (Dana Center) addresses this problem by developing two types of math pathways in high school: algebra-centric and statistics/quantitative reasoning. There are [three goals](#) to this work:

1. Address the inaccurate placement of students in math courses below their ability to perform.
2. Align math content to student needs and career aspirations.

3. Accelerate math learning.

States could engage with the Dana Center on a pilot for math pathways. (Note: The Center for American Progress will publish a report on high school math pathways in 2019.)

English Language Arts and CTE Standards Integration: The Authentic Literacy in CTE Model

This [study](#) by the National Research Center for Career and Technical Education is modeled after the aforementioned Math-in-CTE study, and studies reading models and instructional strategies to improve CTE students' reading comprehension. The study finds statistically significant improvements on reading comprehension and vocabulary learning.

Employability Skills and Standards Alignment at the State Level

As states review their standards, they can use a [professional learning module](#) developed by the College and Career Readiness and Success Center (CCRS Center) on employability skills. While not specifically CTE standards, the integration of general employability skills into academic standards can provide another reinforcement of the development of skills that are needed across every sector for professionals at all levels. The CCRS Center also developed a companion module to meet the employability skill needs of [English learners](#).

The CCRS Center module is designed for use by staff at the state, district, and classroom levels and supports the integration of employability skills into state standards and into classroom instruction. The CCRS Center is a federally funded technical assistance center that provides support and services to state education agencies at no charge. States can contact the CCRS Center at ccrscenter@air.org to receive more information about training on the employability skills framework.

Academic and CTE Standards and Curriculum Alignment Through Project-Based Learning: Arlington Tech High School

Arlington Public Schools, a district located in Virginia, operates [Arlington Tech High School](#) through the district's career center. The school uses a project-based learning approach to integrate twenty-first-century skill development with attainment of early-college credits and industry certifications. Through projects for clients in the community, students and teachers design projects that identify a driving question, specific Virginia state academic standards, and an overview of a problem to be solved. Sample projects include the design of a mixed martial arts self-defense choreographed routine describing the specific angles needed to influence the power and strength of each move. This project identified the Virginia Department of Education math standard G4.

Appendix 5: Examples of High-Quality Performance Assessments³⁰

Performance Assessment Resource Bank

A number of states are using the Performance Assessment Resource Bank (PARB), developed by the Council of Chief State School Officers (CCSSO), as a source of high-quality performance tasks mapped to college- and career-ready standards.³¹ This curated collection of resources serves as a platform for sharing high-quality performance assessments and resources, and brings together educators and leaders who use, develop, and share these tools. The PARB includes performance assessment tasks and support materials for designing and effectively implementing innovative systems of assessment, all focused on more meaningful learning.

Performance Assessment of Competency Education

New Hampshire's Performance Assessment of Competency Education (PACE) is a two-year pilot with eight districts and thirty-six schools that the U.S. Department of Education approved as part of its ESEA waivers to have states include a broader range of measures for student learning. In New Hampshire's PACE districts, educators judge and validate student learning using performance assessments they developed, rather than relying only on an annual state test.³² These performance assessments are aligned to the state's academic achievement standards.³³ The robust, multilevel calibration and moderation processes used in New Hampshire's PACE system also serve as a strong example of high-quality methods used to ensure quality. Protocols are used for training teachers on how to score common tasks, and calibration of scoring is done both within a district and across districts.³⁴ The U.S. Department of Education repeatedly has approved the use of these assessments for accountability purposes as the PACE pilot continues to demonstrate its ability to advance student achievement.³⁵

Endnotes

- ¹ A. P. Carnevale et al., *Three Educational Pathways to Good Jobs: High School, Middle Skills, and Bachelor's Degree* (Washington, DC: Georgetown University Center on Education and the Workforce, 2018), <https://cew.georgetown.edu/cew-reports/3pathways/>. A "good job" is defined as "paying a minimum of \$35,000 for workers between the ages of 25 and 44 and at least \$45,000 for workers between the ages of 45 and 64. This results in 2016 median earnings of \$56,000 for workers without a bachelor's degree, up from \$55,000 in 2015; median earnings of \$75,000 for workers with a bachelor's degree or higher; and overall median earnings of \$65,000 for all good jobs."
- ² Lumina Foundation, "A Stronger Nation: Learning Beyond High School Builds American Talent," <http://strongernation.luminafoundation.org/report/2019/#nation> (accessed March 26, 2019).
- ³ Ibid.
- ⁴ U.S. Department of Education, "Teacher Shortage Areas," <https://www2.ed.gov/about/offices/list/ope/pol/tsa.html#list> (accessed June 28, 2019).
- ⁵ A. P. Carnevale, T. Jayasundera, and A. Gulish, *America's Divided Recovery: College Haves and Have-Nots* (Washington, DC: Georgetown University Center on Education and the Workforce, 2016), <https://1gyhoq479ufd3yna29x7ubjn-wpengine.netdna-ssl.com/wp-content/uploads/Americas-Divided-Recovery-web.pdf>.
- ⁶ S. Kostyo, J. Cardichon, and L. Darling-Hammond, *Making ESSA's Equity Promise Real: State Strategies to Close the Opportunity Gap* (Palo Alto, CA: Learning Policy Institute, 2018).
- ⁷ Ibid.
- ⁸ U.S. Department of Education, "Teacher Shortage Areas."
- ⁹ D. Espinoza et al., *Taking the Long View: State Efforts to Solve Teacher Shortages by Strengthening the Profession* (Palo Alto, CA: Learning Policy Institute, 2018).
- ¹⁰ A. Podolsky et al., *Solving the Teacher Shortage: How to Attract and Retain Excellent Educators* (Palo Alto, CA: Learning Policy Institute, 2016).
- ¹¹ Success Via Apprenticeship Program, <https://www.svapprogram.org/#/> (accessed June 28, 2019).
- ¹² Boston Teacher Residency, "About BTR," <http://www.bpe.org/boston-teacher-residency/about/impact> (accessed June 28, 2019); National Center for Teacher Residencies, *2015 Network Impact Overview* (Chicago, IL: Author, 2016); R. Guha, M. Hyler, and L. Darling-Hammond, *Teacher Residencies: Building a High-Quality, Sustainable Workforce* (Palo Alto, CA: Learning Policy Institute, 2016); J. Solomon, "The Boston Teacher Residency: District-Based Teacher Education," *Journal of Teacher Education* 60, no. 5 (2009): 478–88.
- ¹³ Tennessee State Board of Education, Rules of the Tennessee Department of Education the State Board of Education, https://www.tn.gov/content/dam/tn/stateboardofeducation/documents/massivemeetingsfolder/meetingfiles3/7-22-16_IL_L_Employment_Standards_Rule_0520-01-02-03_Attachment_Clean_Copy.pdf (accessed 07/03/19).
- ¹⁴ Tennessee Department of Education, *Career Forward Task Force* (Nashville, TN: Author, 2016).
- ¹⁵ Virginia Department of Education, "The Path to Industry Certification: High School Industry Credentialing," http://www.doe.virginia.gov/instruction/career_technical/path_industry_certification/index.shtml (accessed June 28, 2019).
- ¹⁶ Tennessee Department of Education, *Career Forward*; Alabama State Department of Education, "Educator Certification > Career/Technical Certificates: Degree Equivalent Technical Education Certificate Approach: Bachelor's Equivalent 1," <https://www.alsde.edu/sec/ec/Pages/deteca.aspx> (accessed June 28, 2019).
- ¹⁷ W. H. Baugh and J. A. Stone, "Mobility and Wage Equilibration in the Educator Labor Market," *Economics of Education Review* 2, no. 3 (1982): 253–74; R. J. Mumane and R. J. Olsen, "The Effects of Salaries and Opportunity Costs on Length of Stay in Teaching: Evidence from North Carolina," *Journal of Human Resources* 25, no. 1 (1990): 106–24; S. Loeb, L. Darling-Hammond, and J. Luczak, "How Teaching Conditions Predict Teacher Turnover in California Schools," *Peabody Journal of Education* 80, no. 3 (2005): 44–70; J. Ondrich, E. Pas, and J. Yinger, "The Determinants of Teacher Attrition in Upstate New York," *Public Finance Review* 36, no. 1 (2008): 112–44.
- ¹⁸ Alaska Department of Education and Early Development, Alaska Department of Labor and Workforce Development, and University of Alaska, *Alaska Career and Technical Education Plan* (Juneau, AK: Alaska Department of Education and Early Development, 2010).
- ¹⁹ A. Picucci, "Early Results Are in: NTC Model Leads to Student Learning," *Impact* (blog), New Teacher Center, May 13, 2016, <https://newteachercenter.org/blog/2016/05/13/early-results-ntc-model-leads-student-learning/>; ———, "New I3 Research Shows Student Achievement Gains Continue with NTC Support," *Impact* (blog), New Teacher Center, August 10, 2016, <https://newteachercenter.org/blog/2016/08/10/new-i3-research-shows-student-achievement-gains-continue-with-ntc-support/>.
- ²⁰ Association for Career and Technical Education, "State Profiles," <https://www.acteonline.org/why-cte/state-profiles/> (accessed June 28, 2019); Ohio Department of Education, "Auditor of State Bulletin 2000-016" (Columbus, OH: Author, 2000), <http://education.ohio.gov/Topics/Finance-and-Funding/School-Payment-Reports/State-Funding-For-Schools/Career-Technical-Funding/Weighted-Funds-Certification-Letter-Calculations>.
- ²¹ D. Carver-Thomas and L. Darling-Hammond, *Teacher Turnover: Why It Matters and What We Can Do About It* (Palo Alto, CA: Learning Policy Institute, 2017).
- ²² J. Oakes, *Keeping Track: How Schools Structure Inequality*, 2nd ed. (New Haven, CT: Yale University Press, 2005).
- ²³ Ibid.
- ²⁴ K. A. Moore and C. Emig, "Integrated Student Supports: A Summary of the Evidence Base for Policymakers," White Paper #2014–05 (Bethesda, MD: Child Trends, 2014).
- ²⁵ Partnership for the Future of Learning, *Community Schools Playbook* (Washington, DC: Author, 2018), <https://communityschools.futureforlearning.org/>.

- ²⁶ A. Maier et al., *Community Schools as an Effective School Improvement Strategy: A Review of the Evidence* (Palo Alto, CA: Learning Policy Institute, 2017).
- ²⁷ J. Cardichon and L. Darling-Hammond, *Advancing Educational Equity for Underserved Youth: How New State Accountability Systems Can Support School Inclusion and Student Success* (Palo Alto, CA: Learning Policy Institute, 2017).
- ²⁸ D. Stern, *What's in a Pathway? Evidence Indicates That Integrated College and Career Pathways Provide More Benefit for Students* (Berkeley, CA: College & Career Academy Support Network, 2016).
- ²⁹ An "eligible recipient" is a local education agency; an area CTE school; an educational service agency; an Indian tribe, tribal organization, or tribal educational agency, or consortium; or an eligible institution or consortium of eligible institutions.
- ³⁰ Grades three, four, and eight use Smarter Balanced assessments, while the SAT typically is administered in grade eleven. R. Guha et al., *The Promise of Performance Assessments: Innovations in High School Learning and College Admission* (Palo Alto, CA: Learning Policy Institute, 2018).
- ³¹ The Performance Assessment Resource Bank is a project of the Understanding Language and Stanford Center for Assessment, Learning, and Equity and the Stanford Center for Opportunity Policy in Education in collaboration with the Council of Chief State School Officers' Innovation Lab Network.
- ³² B. Porter, "How New Hampshire's PACE Is Redefining Measurement and Accountability," *Getting Stuff Done* (blog), Education First, March 29, 2016, <https://education-first.com/how-new-hampshires-pace-is-redefining-measurement-and-accountability/>.
- ³³ S. Lyons et al., *New Hampshire Performance Assessment of Competency Education (PACE): Technical Manual 2016–2017* (Dover, NH: National Center for the Improvement of Educational Assessment, 2017).
- ³⁴ Ibid.
- ³⁵ J. Botel, *PACE Waiver Extension* (Washington, DC: U.S. Department of Education, 2017).

