CAREER CONNECTED ILLINOIS

Opportunities for Success

# High-Quality CTE:

## What the Literature Says About Standards, Curriculum, Instruction, and Partnerships

A white paper for CTE practitioners and leaders in Illinois | June 2022

# About

## Career ConneCTEd Illinois

Career and Technical Education (CTE) programs in Illinois provide instruction for careers in high-wage, high-skill, and in-demand occupations.

**https://www.isbe.net/cte**

## The Illinois State Board of Education

The mission of the Illinois State Board of Education (ISBE) is to provide each and every child with safe and healthy learning conditions, great educators, and equitable opportunities by practicing data-informed stewardship of resources and policy development, all done in partnership with educators, families, and stakeholders.

**https://www.isbe.net**

## Northern Illinois University (NIU) CTE Learning Project

Together, NIU STEAM and the Illinois P-20 Network, both housed in the Center for P-20 Engagement in Northern Illinois University's Division of Outreach, Engagement and Regional Development, lead the NIU CTE Learning Project, which works in collaboration with the CTE and Innovation team at the Illinois State Board of Education to support curriculum development, the creation and use of instructional materials, professional learning, and teacher recruitment and retention in CTE.

**https://niu.edu/niusteam** and **https://niu.edu/p20network**

# Executive Summary

The purpose of this white paper is to equip the educational community in Illinois with foundation and direction regarding instructional materials, professional learning, and questions for ongoing and future research regarding career and technical education (CTE). As such, it provides an overview of the most effective and inclusive practices related to curriculum, instructional resources, instructional strategies, and business and community partnerships specifically in the context of secondary school CTE.

This summary highlights a selection of the most salient findings from the paper.

**Defining Quality in CTE**

In the absence of a single national standard for CTE levels of quality, there are numerous definitions of what constitutes CTE quality that inform policymakers and practitioners. Despite variations with respect to priorities and emphasis, definitions of CTE quality cohere around effective curriculum, instructional strategies and resources, and business and community partnerships. In combination, these distinct elements facilitate the development and sustainability of programs of study that expand access to learning opportunities for students. In so doing, they enable students to develop the skills and knowledge—and gain meaningful experience—that enable success in a chosen career or in a postsecondary program of study.

**CTE research is characterized by notable limitations.**

Compared to other subject areas in K-12 education, there are few studies focused on CTE learning standards; high-quality curriculum; and effective instructional practices, strategies, and resources/materials. At the same time, CTE research is also constrained by hyper-specificity, with a significant amount of research centered on individual content areas with limited general applicability to the CTE field. Consequently, there is limited research evidence for some of the most commonly lauded CTE programs and curricular elements, such as work-based learning and career academies.

**Most states have secondary level state CTE standards in place but they vary significantly.** While 46 states have such standards, only 16 have them at the program level. Moreover, in most states there is a notable mismatch between existing state CTE standards and the Common Career Technical Core.

**Quality CTE curriculum is critical.**

Fundamentally, quality CTE curricula align to both academic and industry standards. Students should participate in and have access to work-based learning opportunities, and there should be Integration of academic and technical knowledge and skills into the program curriculum. Furthermore, quality curricula incorporate diverse, accessible, and engaging Career and Technical Student Organizations.

**High-quality instructional strategies, practices, and resources are necessary in all CTE classrooms.** Lessons should align standards, content, and skills that are relevant to students and to their futures in the workplace. Learning should happen through students engaging in authentic, problem-based learning. Similarly, there should be integration across traditional academic disciplines in complex, authentic scenarios. Additional dimensions of high-quality instruction include collaboration among students and with business and community partners and authentic assessment that provides meaningful feedback for students.

**Inclusion, access, and equity must be intentionally built-in to CTE programs.** To do this, programs should ensure consistent and adequate levels of funding for everything from teachers and supplies to transportation and extra-curricular activities. They should engage with students via real experiences with a wide range of careers, students should have opportunities to ask questions about career pathways. Quality programs also create a sense of belonging and community by facilitating shared experiences, using thoughtful language, and fostering respectful relationships.

**Business and community partnerships are vital to high-quality CTE experiences.** Business and community partnerships succeed when there is a shared focus on creating and sustaining long-term partnerships. Partners can collaboratively develop shared goals and create opportunities for sustainable communication among business and community partners and school districts.

*High-Quality CTE: What the Literature Says About Standards, Curriculum, Instruction, and Partnerships* provides both the community of CTE educators in Illinois and the broader educational community in Illinois with direction in the following areas:

- Curriculum, Instructional Materials, and Instructional Strategies
- Professional Learning
- Ongoing Research

*This white paper provides an overview of the most effective and inclusive practices related to curriculum, instructional resources, instructional strategies, and business and community partnerships specifically in the context of secondary school career and technical education.*

## Defining Career and Technical Education

The National Center for Education Statistics defines career and technical education (CTE) as "courses (at the high school level) and programs (at the postsecondary [sub-baccalaureate] level) that focus on the skills and knowledge required for specific jobs or fields of work."[1] Nationally, these jobs and fields of work are organized into **16 career clusters**:

- Agriculture, Food & Natural Resources
- Architecture & Construction
- Arts, A/V Technology & Communications
- Business Management & Administration
- Education & Training
- Finance
- Government & Public Administration
- Health Science
- Hospitality & Tourism
- Human Services
- Information Technology
- Law, Public Safety, Corrections & Security
- Manufacturing
- Marketing
- Science, Technology, Engineering & Mathematics
- Transportation, Distribution & Logistics

[1] "About CTE Statistics," **https://nces.ed.gov/surveys/ctes/about.asp**

In Illinois, Energy is considered a separate and 17th Career Cluster. Additionally, as a result of Illinois' Postsecondary and Workforce Readiness Act (PWR Act), signed into law in 2016, Illinois has also built a system around seven College and Career Pathways, into which the Career Clusters fit. These seven College and Career Pathways are:

- Agriculture, Food and Natural Resources
- Arts and Communications
- Finance and Business Services
- Health Science and Technology
- Human and Public Services
- Information Technology
- Manufacturing, Engineering, Technology and Trades

More expansively, Advance CTE—one of the most prominent non-profit membership organizations that represents state CTE leaders—defines CTE as education that "provides students of all ages with the academic and technical skills, knowledge and training necessary to succeed in future careers and to become lifelong learners."[2]

At the federal level, funding for CTE is authorized through the Carl D. Perkins Career and Technical Education Act. First passed in 1984, the Perkins Act has been reauthorized four times (1990, 1998, 2006, and 2018). The most recent reauthorization, known as Perkins V, is described by the Illinois State Board of Education (ISBE) as funding efforts "to develop more fully the academic knowledge and technical and employability skills of secondary education students and postsecondary education students who elect to enroll in CTE programs and programs of study. Perkins V requires secondary, postsecondary and business/industry to work together to strengthen career and technical education for students."[3] Perkins funding supplements funding from the states and funding allocated by local education agencies.

> CTE provides students of all ages with the academic and technical skills, knowledge and training necessary to succeed in future careers and to become lifelong learners.

[2]"Career Technical Education," **https://careertech.org/cte**

[3]"College & Career: Perkins V," **https://www.isbe.net/perkins#:~:text=Perkins%20V%20requires%20secondary%2C%20postsecondary,and%20technical%20education%20for%20students**.

In Illinois, in advance of Perkins V, the Postsecondary and Workforce Readiness Act (PWR Act) was signed into law by Governor Rauner in 2016. This bipartisan legislation passed unanimously through the General Assembly, and it focused on four major initiatives to support career and college readiness:

- Postsecondary and Career Exploration Framework (PaCE Framework)
- Career Pathway Endorsements
- Competency-Based Education
- Transitional Instruction

When the PWR Act became law, there were not significant ongoing resources to fund these efforts in school districts locally throughout the state. Rather, the development of each of these areas at the state-level was funded by the state educational agencies, both ISBE and, in some cases, the Illinois Community College Board (ICCB). Additional local support was provided through grants from state agencies that funded planning and professional learning efforts in community colleges and school districts, as well as through state-wide professional development outreach efforts.

After the passage of Perkins V at the federal-level, each state was required to submit its Perkins V plan to the U.S. Department of Education. The Illinois Perkins V Plan, which was jointly developed by ISBE and ICCB, was designed to align with the PWR Act, and this ensured that the infusion of federal Perkins money was used to further career readiness and career preparation through the components outlined by the PWR Act.

Today, efforts continue throughout Illinois, both those led by the state agencies and those taking place locally in school districts and community colleges, to implement the key aspects of the PWR Act as a means to improve learning for all students and to further the development of CTE.

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## Limitations of CTE Research

Compared to other subject areas in K-12 education, there are few studies focused on learning standards; high-quality curriculum; and effective instructional practices, strategies, and resources/materials that pertain to CTE. For example, there are only two randomized control trial studies of CTE; by comparison, in the What Works Clearinghouse there are 83 programs with experimental or quasi-experimental evidence in the area of early childhood education, 39 for dropout-prevention, and 32 for English language learners.[4]

At the same time, the literature on CTE is also constrained by hyper-specificity. Researchers at the University of Georgia summarize three issues that impede the field of CTE research with respect to the content focus and quality of the research, as well as its comparative isolation from the larger body of education research. Specifically, they note that "content area loyalty" limits the broader applicability to other content areas and that "examples can easily be identified of content-specific research being (mis)represented as a reflection of comprehensive CTE issues, when the work often represents limited applicability to broader CTE efforts."[5]

This tendency toward narrow content-area-focused research results "in a type of tunnel vision where research is (a) often narrow in scope and hard (or impossible) to generalize to broader CTE concerns, (b) conducted with relatively small samples of convenience, and (c) largely ignored by the greater educational research community."[6] The researchers distill these points by noting that "too often CTE research is characterized by one-shot studies answering simple descriptive research questions that are analyzed with techniques that belie the increasingly complex nature of the environments in which we work."[7]

Similarly, a 2017 analysis by MDRC points out that despite widespread enthusiasm about new models of CTE delivery, "the evidence behind CTE is limited, and the evidence that does exist varies in quality," noting that there are vanishingly few randomized control-trials, and much of the existing evidence is observational in nature.[8]

[4]"What we know about Career and Technical Education in high school," **https://www.brookings.edu/research/what-we-know-about-career-and-technical-education-in-high-school**

[5]"Positioning Research and Practice in Career and Technical Education: A Framework for College and Career Preparation in the 21st Century," **http://www.ingentaconnect.com/content/10.5328/cter39.2.137**

[6]"Positioning Research and Practice in Career and Technical Education: A Framework for College and Career Preparation in the 21st Century," **http://www.ingentaconnect.com/content/10.5328/cter39.2.137**

[7]"Positioning Research and Practice in Career and Technical Education: A Framework for College and Career Preparation in the 21st Century," **http://www.ingentaconnect.com/content/10.5328/cter39.2.137**

[8]"Career and Technical Education Current Policy, Prominent Programs, and Evidence," **https://www.mdrc.org/sites/default/files/CTE_Paper-Final.pdf**

It is also important to note that a significant proportion of the CTE research and literature focuses on quantifying student outcomes—both at the secondary and postsecondary levels and in terms of professional/workforce outcomes—to evaluate the effect of CTE, as a content area or program of study, as opposed to how the quality of standards, curricula, or instruction impacts student outcomes. For example, the MDRC study points out that the effects of CTE on graduation rates, the effects of dosage (i.e., whether students take a few courses or become CTE "concentrators"), and the effects of specific program models (but not curriculum or instructional quality per se) are frequently the subject of observational studies that do not (and cannot) determine a causal relationship among inputs and those effects.[9]

As such, there is limited research evidence for some of the most commonly lauded CTE program and curricular elements, such as work-based learning[10] and career academies.[11]

Additionally, as the State of Illinois takes a comprehensive P-20 approach to learning and career and college readiness, not only is additional research needed in traditional secondary and postsecondary CTE settings, such as high schools and community colleges, there would also be a strong interest in research related to CTE, career exploration, and the development of both academic skills, as well as Illinois' Cross-Sector Essential Employability Competencies in middle schools and elementary schools. Likewise, as equity and opportunity are central tenets of Illinois' statewide educational focus, it will be critical to prioritize research that focuses on systems and strategies related to diversity, equity and inclusion in CTE programs and classrooms.

With these limitations in mind—and informing and tempering understanding of the policies and practices discussed subsequently—this review represents an attempt to synthesize an overview of best practices based on the available CTE research and literature without overstating the evidence base in support of the strategies and practices discussed. Care has been taken to prioritize inclusion of strategies and practices applicable across career clusters and not specific only to one career cluster or career pathway (such as in the discussion of CTE curriculum).

[9]"Career and Technical Education Current Policy, Prominent Programs, and Evidence," **https://www.mdrc.org/sites/default/files/CTE_Paper-Final.pdf**

[10]"Career and Technical Education Current Policy, Prominent Programs, and Evidence," **https://www.mdrc.org/sites/default/files/CTE_Paper-Final.pdf**

[11]"What we know about Career and Technical Education in high school," **https://www.brookings.edu/research/what-we-know-about-career-and-technical-education-in-high-school**

## Defining Quality in CTE

CTE quality, both at the level of programs of study and in terms of curriculum and instruction, has been variously described and defined. In a broad statement of what high-quality CTE can accomplish, the American Institutes of Research (AIR) notes that

> "high-quality CTE addresses the goals of college and career readiness and provides learning options that are appealing for students who might otherwise be at risk of leaving high school. High-quality CTE programs and pathways ensure that coursework is simultaneously aligned to rigorous academic standards and postsecondary expectations and informed by and built to address the skills needed in specific career pathways."[12]

But, more specifically, what makes for high-quality CTE? Researchers note that there is "no single standard for levels of quality of CTE programs, and different states have different emphases," as do CTE researchers themselves.[13] To take one representative example, the director of the National Research Center for Career and Technical Education (NRCCTE), James Stone, suggests that "high-quality CTE should employ three pedagogical strategies: classroom instruction, work-based learning, and career and technical student organizations."[14]

Expounding on these three strategies, an NRCCTE presentation on research-based pedagogies in CTE posits that *effective classroom instruction* includes project-based learning, contextualized learning, and labs and shops; *effective work-based learning* includes job shadowing, internships, "school-based enterprise," cooperative education, and apprenticeships; *career and technical student organizations* incorporate professional development, leadership development, service/social engagement, and competitive events.[15]

[12]"How Career and Technical Education Can Help Students Be College and Career Ready: A Primer," **https://files.eric.ed.gov/fulltext/ED555696.pdf**

[13]High Quality Career and Technical Education: Implications for Nevada," **https://digitalscholarship.unlv.edu/co_educ_policy/11**

[14]"More Than One Way: The Case for High-Quality CTE," **https://www.aft.org/ae/fall2014/stone**

[15]"Research Based Pedagogies for Career & Technical Education," **https://www.sreb.org/sites/main/files/file-attachments/acte-2015_research-based_cte_pedagogies_stone.pdf?1632752750**

Since it was finalized and released in 2018, the *ACTE Quality CTE Program of Study Framework* has become one of the foremost articulations of what constitutes quality in CTE. The evidence-based framework, which ACTE notes is the result of "research, several rounds of feedback and pilot testing," features 12 elements (with a total of 92 criteria undergirding them) of high-quality CTE, including:

1. Standards-aligned and Integrated Curriculum
2. Sequencing and Articulation
3. Student Assessment
4. Prepared and Effective Program Staff
5. Engaging Instruction
6. Access and Equity
7. Facilities, Equipment, Technology and Materials
8. Business and Community Partnerships
9. Student Career Development
10. Career and Technical Student Organizations (CTSOs)
11. Work-based Learning
12. Data and Program Improvement

Accordingly, reference to and discussion of the ACTE framework recur throughout this review of the research. In particular, the criteria specific to Standards-aligned and Integrated Curriculum, Engaging Instruction, and Business and Community Partnerships are excerpted in each of the sections to which they align thematically.

# Secondary Level State CTE Standards

The most comprehensive analysis of state CTE standards—and their alignment with the Common Career Technical Core—dates back to 2013 (five years before Perkins V reauthorization). The Association for Career & Technical Education (ACTE) published "The State of Career Technical Education: An Analysis of State CTE Standards," which details findings from a study designed to "compare state CTE standards to the Common Career Technical Core and gather information on the major policy levers and structures that support the adoption and implementation of CTE standards."[16] The authors note that their study represents the first time that this particular set of information had been gathered and published.[17] The most salient findings, for the purposes of this review, include:[18]

- 46 states have state-approved secondary CTE standards
  - 16 states have course-level standards
  - 16 states have program-level standards
  - Seven states have both course- and program-level standards (Alabama, Colorado, Florida, Georgia, Indiana, Kansas, and Mississippi)
- "There is a significant mismatch between states' current CTE standards and the Common Career Technical Core, largely explained by the level of state standards (i.e., secondary course-level) and the level of the CCTC (i.e., end of program-of-study level)."

As Illinois works to develop its own standards for CTE, this mismatch—and its underlying explanation—is important to consider. To ensure close alignment to the CCTC, Illinois will need higher-level standards, such as those at the career pathway, career cluster, or program-of-study level. This would not preclude course-level standards, but instead inform any effort to develop complementary standards for courses.

The ACTE study singles out Florida's standards to highlight the value of secondary and postsecondary-level and industry alignment, noting that Florida "delivers CTE programs and courses through three different systems – secondary, postsecondary/adult vocational (PSAV), and postsecondary degree/certificate programs. The state maintains a separate set of industry-driven CTE standards (i.e., curriculum frameworks) for each of its delivery systems; however, the three sets of CTE standards are developed concurrently by the same committee of business/industry, secondary and postsecondary representatives."[19]

[16]"The State of Career Technical Education: An Analysis of State CTE Standards," **https://cte.careertech.org/sites/default/files/State-CTE-Standards-ReportFINAL.pdf**

[17]"The State of Career Technical Education: An Analysis of State CTE Standards," **https://cte.careertech.org/sites/default/files/State-CTE-Standards-ReportFINAL.pdf**

[18]"The State of Career Technical Education: An Analysis of State CTE Standards," **https://cte.careertech.org/sites/default/files/State-CTE-Standards-ReportFINAL.pdf**

19"The State of Career Technical Education: An Analysis of State CTE Standards," **https://cte.careertech.org/sites/default/files/State-CTE-Standards-ReportFINAL.pdf**

Table 1 provides an overview of the percent of state standards that are aligned, partially aligned, or not aligned with the ACTE standards in each Career Cluster according to ACTE's own analysis. It should be noted that Illinois' Energy Career Cluster is not included in this analysis because it is not one of ACTE's 16 Career Clusters. It is also important to point out that the last column highlights the number of states that had standards that were analyzed in this study, and this number varies from Career Cluster to Career Cluster, ranging from 16 for the Government and Public Administration Career Cluster, which represents the lowest number of states by far to the next lowest of 29 states for Law, Public Safety, Corrections and Security. Most of the Career Clusters were analyzed for between 38 and 41 states.

**Table 1. State Secondary CTE Standards Alignment to Common Career Technical Core**

| CAREER CLUSTER | AVERAGE % ALIGNED | AVERAGE % PARTIALLY ALIGNED | AVERAGE % NOT ALIGNED | TOTAL # OF STATES (N SIZE) |
|---|---|---|---|---|
| Agriculture, Food & Natural Resources | 39 | 32 | 29 | 41 |
| Architecture & Construction | 35 | 29 | 36 | 39 |
| Arts, A/V Technology & Communications | 35 | 21 | 44 | 40 |
| Business Management & Administration | 59 | 24 | 17 | 40 |
| Education & Training | 34 | 28 | 38 | 37 |
| Finance | 34 | 30 | 36 | 39 |
| Government & Public Administration | 41 | 17 | 42 | 16 |
| Health Science | 38 | 29 | 33 | 40 |
| Hospitality & Tourism | 35 | 24 | 41 | 38 |
| Human Services | 30 | 26 | 44 | 41 |
| Information Technology | 41 | 29 | 30 | 39 |
| Law, Public Safety, Corrections & Security | 35 | 20 | 45 | 29 |
| Manufacturing | 37 | 28 | 35 | 38 |
| Marketing | 45 | 31 | 24 | 41 |
| Science, Technology, Engineering & Mathematics | 40 | 30 | 30 | 40 |
| Transportation, Distribution & Logistics | 29 | 29 | 51 | 38 |

*Source: ACTE[20]. Table reproduced.*

[20]"The State of Career Technical Education: An Analysis of State CTE Standards," **https://cte.careertech.org/sites/default/files/State-CTE-Standards-ReportFINAL.pdf**

Since the publication of "The State of Career Technical Education," ACTE has not updated the study or its findings to account for changes in state CTE standards, CCTC alignment, or policy changes in response to Perkins V reauthorization. Unfortunately, this review did not identify any similar, or more recent, analyses of state CTE standards.

Notably, a broader study from 2017, which was prior to the reauthorization of Perkins V, focused less on types of standards and CCTC alignment and more on how state-level quality indicators are used to determine the rigor of secondary and postsecondary CTE programs of study. In this study, researchers found that 34 states had implemented curriculum quality elements, making curriculum-related elements the second most common type (behind staffing-related elements). Elements related to instruction were identified in 29 states. Furthermore, the researchers identified 21 states that had implemented access/equity-related elements (the 11th most common type).[21]

### Standards vs. Curriculum

The distinction between standards and curriculum is important to note. As articulated by the Southern Regional Education Board (SREB), "standards are the goals for instruction;" they are developed at the state level, are typically based on best practices, and are used to guide instruction.

Curriculum is "the content of instruction;" it is selected or developed at the local level and is used by teachers "to help students develop the skills and understanding required by each standard."[22]

[21]"Quality Indicators Guiding Secondary Career and Technical Education Programs of Study," **https://digitalscholarship.unlv.edu/cgi/viewcontent.cgi?article=1012&context=jrtc**

[22]"Standards vs. Curriculum: What's the Difference?" **https://www.sreb.org/sites/main/files/file-attachments/2022standards_vs_curriculum_page1.pdf?1644497345**

# Quality CTE Curriculum

The ACTE framework defines curriculum quality in terms of alignment to content and technical standards, both for career-specific competencies and for core academic subjects (e.g., literacy and math), as well as to standards for employability skills (e.g., critical thinking and professionalism).

Importantly, ACTE indicates that alignment to standards is not, in and of itself, sufficient to ensure curriculum is high-quality; curriculum must also provide students with authentic opportunities for applied, hands-on learning and skills development.

ACTE also emphasizes the importance of industry and employer engagement in determining the technical standards to which program curricula are aligned, as well as in the regular review and revision of curricula to ensure that it is up-to-date with industry advances and the latest program models.

### *ACTE Quality Framework Element: Standards-aligned and Integrated Curriculum*

- **a.** The curriculum is based on industry-validated technical standards and competencies.
- **b.** The curriculum is aligned with relevant content and standards for core subjects, such as reading, math and science, including federal, state and/or local standards, as appropriate.
- **c.** The curriculum incorporates employability skill standards that help students succeed in the workplace, such as problem solving, critical thinking, teamwork, communications and workplace etiquette.
- **d.** The program of study curriculum is developed with employer input to prepare students for both further education and in-demand and emerging careers.
- **e.** The curriculum allows for student application of integrated knowledge and skills in authentic scenarios.
- **f.** Program of study standards are publicly available and accessible to students, parents/guardians (as appropriate), partners and the public.
- **g.** The curriculum is reviewed regularly by all relevant stakeholders and revised as necessary to reflect the latest advances in the industry, evidence-based program models and evaluations of student performance.

More broadly, the literature and research on CTE curriculum, as well as state policy and informational documents and rubrics, consistently identify a narrow range of components/elements that make-up quality CTE programming and instruction. These include: alignment to standards (state and industry), work-based learning experiences, career and technical student organizations (CTSOs), integration of academic and technical skills/knowledge development (or alignment with core subject standards).

In this vein, guidance on best practices for CTE curriculum and characterizations of curriculum quality predominantly focuses on the types of learning opportunities it provides. Examples from several other states are instructive.

The Wisconsin Department of Education describes quality CTE as comprising three essential components: academic and technical skills development, leadership and 21st Century skills development through CTSOs, and work-based learning.[23]

The California Department of Education guide for developing standards-aligned CTE programs and curricula highlights contextual (e.g., hypothetical or simulated situations and conditions), experiential (e.g., CTSOs, career-based service, entrepreneurial activities), and work-based (e.g., job shadowing, mentoring, school-based enterprises, internships, co-ops and apprenticeships) learning opportunities as key elements of high-quality curricula.[24]

The Massachusetts Department of Education "Career and Technical Education Quality Assessment Tool" provides a three-category approach to parsing elements of CTE quality: "Foundational Elements" (which are practices that are either required by law/regulation or that are "fundamentally good practices"); "Elements of Emerging Quality," (a designation for "practices that exceed simple compliance or basic structures"); and "Elements of Established Quality" (which is to say, "practices that build upon practices in the "Emerging Quality" category and/or reflect the development of systems and structures, including rigorous data analysis, to support the perpetuation of quality practice").[25] The following list is excerpted from the "Curriculum Content" section of the assessment tool.[26]

[23]"Career and Technical Education," **https://cte.careertech.org/sites/default/files/WisconsinBrochure-2013_1.pdf**

[24]"Career Technical Education Framework for California Public Schools: Grades Seven Through Twelve," **https://www.cde.ca.gov/ci/ct/sf/documents/cteframework.pdf**

[25]"Career and Technical Education Quality Assessment Tool," **https://www.doe.mass.edu/ccte/cvte/resources/quality-assess-tool.docx**

[26]"Career and Technical Education Quality Assessment Tool," **https://www.doe.mass.edu/ccte/cvte/resources/quality-assess-tool.docx**

## FOUNDATIONAL ELEMENTS

- Program is based on the Massachusetts Curriculum Frameworks and the applicable Massachusetts Vocational Technical Framework
- Program curriculum provides opportunities for students to gain a thorough understanding of all aspects of an industry
- Content is coherent and rigorous and aligns with challenging academic standards and relevant technical knowledge and skills
- Program contributes to students' higher-order reasoning and problem-solving skills
- Program provides students with general employability knowledge and skills
- Program provides students with occupational safety and health knowledge and skills
- Program provides students with management and entrepreneurship knowledge and skills
- Program provides students with technological knowledge and skills
- All students, including special populations, have access to the curriculum
- The curriculum is modified as required to meet the needs of special populations
- Curriculum provides at least one credentialing option for students (e.g., articulated dual enrollment credits, industry-recognized credential)

## ELEMENTS OF EMERGING QUALITY

- Program has developed and implemented interventions and supports as needed to help students transition to postsecondary education and/or employment
- Curriculum provides students with multiple credentialing options
- Program stakeholders review and revise curriculum regularly to reflect new competencies, new technologies, changing labor market needs and current and/or emerging teaching strategies/ pedagogical approaches

## ELEMENTS OF ESTABLISHED QUALITY

- Program successfully prepares all students for transition to postsecondary education and/or employment with minimal need for remediation
- Upon completion of the program, all students have earned at least one major credential and/or transferable college credits

There are a number of consistent elements that emerge from across these state frameworks. These elements include:

- Integrated and problem-based/project-based learning opportunities
- Integration of core curricular skills, such as literacy and math skills, within CTE classrooms
- Opportunities for a wide range of career development experiences, ranging from job shadowing to internships and apprenticeships
- Consistent and ongoing review of CTE standards and curriculum to ensure that they remain relevant and aligned with changes in the workplace

For this last point, the consistent and ongoing review of CTE standards and curriculum, the importance of employer and industry input and review is frequently highlighted as essential to ensuring quality curriculum. In keeping with this, employer input is identified as one of the ACTE framework criteria for curriculum (see the later section on Business and Community Partnerships for further discussion of the role of employers in CTE).

# Instructional Strategies, Practices, and Resources

With respect to high-quality instruction, best practices that apply to instruction in the core academic subjects (for example, project-based learning opportunities and differentiated instruction) are just as relevant to CTE. In fact, it can be argued that the integration of hands-on, experiential learning with subject-matter focused content that occurs in high-quality CTE programs of study actually exemplifies many of the instructional practices that should be more widespread in core academic subjects.

The ACTE quality framework emphasizes this point; of the seven criteria that undergird the "Engaging Instruction" element, four highlight either some form of project-based learning, contextualized instruction, differentiated/personalized instruction, or the incorporation of relevant equipment and resources that support such instruction. Moreover, the ACTE framework posits that effective instruction—like effective, high-quality curriculum—is animated by standards and learning objectives.

### ACTE Quality Framework Element: Engaging Instruction

- **a.** Program of study instruction is driven by relevant content area standards and learning objectives.
- **b.** Project-based learning and related instructional approaches, such as problem-based, inquiry-based and challenge-based learning, are fully integrated into the program of study.
- **c.** Contextualized instruction results in students applying technical, academic and employability knowledge and skills within authentic scenarios.
- **d.** Instruction emphasizes the connection between academic and technical knowledge and skills, including through cross-disciplinary collaboration.
- **e.** Instruction incorporates relevant equipment, technology and materials to support learning.
- **f.** Instruction is flexible, differentiated and personalized to meet the needs of a diverse student population.
- **g.** Management of the educational environment builds a culture of learning and respect.

The CTE Technical Assistance Center of New York suggests that high-quality CTE instruction builds life/career, academic, and technical knowledge and skills and is defined by five characteristics: **alignment** ("technical skills developed align with the tools and processes currently used in employment"), **relevance** ("student work is based on real-world problems and projects"), **rigor** ("academically challenging, requiring higher-level thinking skills"), **safety** ("students follow established safety procedures to protect themselves and others"), and **engagement** ("students are mentally and emotionally connected to the work and exhibit behaviors that show continued interest in learning").[27]

Similarly, the Southern Regional Education Board (SREB), in its educator-focused resource "Powerful Career and Technical Education Instructional Practices," posits that embracing six instructional practices leads to "high-quality learning experiences and high-performance classrooms that motivate students to make the effort needed to achieve rigorous technical, academic and workplace standards."[28] These practices are defined as follows:[29]

- The learning environment sets high expectations and uses the protocols of business and industry to promote and sustain student motivation, persistence and effort.
- Planned, authentic units of study and summative tasks align with workforce expectations and allow students to demonstrate their mastery of technical, academic and employability skills.
- Intentional collaborations with teachers, families and business, industry, postsecondary and community partners enhance the relevancy of lessons and assignments and promote students' retention of the concepts, skills and competencies that are valued in the workplace.
- Integration of relevant literacy, math and science concepts and skills helps students deepen their understanding and transfer skills across academic and technical disciplines and career fields.
- Opportunities to engage in experiential learning using industry-standard technology and equipment empower students to apply what they learn in the classroom or lab to solve authentic workplace problems.
- Rigorous assessments and learning activities allow students to receive feedback from teachers, peers and authentic audiences, engage in personal reflection and apply their understanding of academic, technical and workplace knowledge and skills to solve authentic problems.

[27]"CTE Instruction," **https://nyctecenter.org/instruction/cte-instruction**

[28]"Powerful Career and Technical Education Instructional Practices," **https://www.sreb.org/publication/powerful-cte-instructional-practices**

[29]"Powerful Career and Technical Education Instructional Practices," **https://www.sreb.org/publication/powerful-cte-instructional-practices**

## Instructional Resources

While many states, districts, and CTE-oriented organizations offer example or model instructional resources for CTE educators, they often do so without warranting the evidence/research upon which those resources are based (or noting the lack thereof). Similarly, the literature is scarce when it comes to validating the efficacy of CTE instructional resources and how well they support specific student populations, such as English language learners or students who have struggled with math or reading.

While many states, districts, and CTE-oriented organizations offer example or model instructional resources for CTE educators, they often do so without warranting the evidence/research upon which those resources are based (or noting the lack thereof).

Instead, and in keeping with other aspects of CTE, instructional resources tend to be described in terms of the characteristics of quality, and often primarily at the program level (such as in terms of availability and processes for vetting, rather than in terms of classroom use or the resources per se). Again, the following criteria excerpted from the Massachusetts Department of Education quality assessment tool provide a useful example:

### FOUNDATIONAL ELEMENTS

- Program has basic resources available to permit students to acquire skills and knowledge with respect to:
  - safety and health
  - a technical discipline
  - embedded academics
  - employability
  - management and entrepreneurship
  - technology
- Curricular materials are culturally inclusive and free of bias

### ELEMENTS OF EMERGING QUALITY

- Curricular and instructional materials are available to meet individual student needs
- Program has a wide array of resources and materials that provide for challenging and enriched learning
- Program's curricular and instructional resources reflect technological advances in technical content areas
- Program maximizes access to instructional resources by developing and maintaining partnerships with local businesses, industries, and institutions
- Affected staff are trained in any new curriculum and/or instructional materials prior to implementation

### ELEMENTS OF ESTABLISHED QUALITY

- Administration develops and maintains systems and structures to ensure that the program's materials are routinely replaced and updated to remain current
- Program stakeholders, including parents/guardians, students, and Program Advisory Committee members are involved in vetting curricular and instructional materials prior to procurement
- Administration develops systems and structures to review materials and resources routinely for cultural inclusivity and absence of bias
- Systems and structures exist to ensure that all affected staff are proficient in the use of any new curriculum and/or instructional materials

## Inclusive Instruction, Access, and Equity in CTE

Ensuring that CTE is inclusive, accessible, and equitable is fundamental to quality. Without these attributes, the quality of a given program of study is diminished and the program's impact is constrained. The ACTE quality framework articulates the importance of inclusivity, accessibility, and equity as program characteristics that require proactive efforts, as opposed to being passive qualities. Ranging from intentional recruitment and outreach to traditionally underrepresented student populations to the provision of equitable support services and mitigation/elimination of known barriers to learning opportunities, high-quality CTE programs actively seek out and refine approaches to enable more students to participate and thrive.

### *ACTE Quality Framework Element: Access and Equity*

**a.** The program of study is promoted to all potential participants and their parents/guardians (as appropriate), in a manner that is free from bias, inclusive and non-discriminatory.

**b.** Students are actively recruited from populations that have been traditionally underrepresented,including by gender, race and ethnicity, and/or special population status.

**c.** Career guidance is offered to all potential and current program of study participants in a manner that is free from bias, inclusive and non-discriminatory.

**d.** Facilities, equipment, technology and materials are provided in a way that ensures all students have the opportunity to achieve success in the program of study, including by meeting Title IX, Americans with Disabilities Act and other accessibility requirements.

**e.** Curriculum, instruction, materials and assessments are free from bias, inclusive and non-discriminatory, and offered in a way that ensures all students have the opportunity to achieve success in the program of study, including through accommodations, as appropriate.

**f.** Supportive services, such as tutoring and transportation assistance, are provided to ensure all students have the opportunity to achieve success in the program of study, as appropriate.

**g.** Appropriate actions are taken to eliminate barriers to extended learning experiences, such as work-based learning, CTSO participation and articulated credit, for all students, including special populations.

One of the most salient and cross-cutting articulations of what characterizes inclusive instruction is the fifth criteria of the Access and Equity element in the ACTE quality framework. This criteria stipulates that accessible and equitable "curriculum, instruction, materials and assessments are free from bias, inclusive and non-discriminatory, and offered in a way that ensures all students have the opportunity to achieve success in the program of study, including through accommodations, as appropriate."[30]

[30]"2018 ACTE Quality CTE Program of Study Framework," **https://www.acteonline.org/wp-content/uploads/2019/01/HighQualityCTEFramework2018.pdf**

While not strictly research-based, organizations the National Alliance for Partnerships in Equity (NAPE) provide helpful guidance in thinking about instructional strategies that can improve equity and inclusion. For example, NAPE recommends the following equity and inclusion-focused instructional strategies for CTE:

- Use maker space activities to expand curriculum into student-centered and problem-based learning strategies
- Integrate Culturally Responsive Teaching (CRT) to increase a sense of belonging for underrepresented students and sustain innovation in the classroom
- Schedule ongoing and regular assessment of student responses and attitudes about new curriculum initiatives. Valuing student voices makes a difference.
- Build equitable extracurricular engagement for underrepresented students to increase professional and personal development in career paths
- Identify funding for partnerships and curriculum development to expand equity innovations into employer and community contexts.[31]

More often, the literature focuses on issues and strategies related to access and equity at the program, district, and state level. This is not without good reason, as inequities and access challenges persist everywhere. For example, areas with more concentrated wealth are more likely to have high-quality CTE programs.[32] Advance CTE recommends that states "create publicly reported equity indices to better design and evaluate interventions and supports for marginalized learners" as well as design and conduct statewide equity audits and require local education agencies to do the same at the local level.[33] With the ISBE CTE team's launch of the Illinois CTE Data Portal on the ISBE website during the 2021-2022 school year, ISBE is trying to empower stakeholders with this type of information for this exact purpose.

[31]"Equity in CTE & STEM Root Causes and Strategies: A Call to Action," **https://napequity.org/wp-content/uploads/RC_Call-To-Action_FNL_2021-04-24.pdf**

[32]"Four Strategies to Address Equity in CTE," **https://files.eric.ed.gov/fulltext/EJ1229646.pdf**

[33]"Pushing the Limits," **https://cte.careertech.org/sites/default/files/files/resources/CTEWithoutLimits_Roadmap_Oct2021.pdf**

# Business and Community Partnerships

Effective school district partnerships with businesses, industry, and community-based entities are vital to quality CTE programs and instruction. Not only do such partnerships enable the authentic, hands-on, and industry-aligned learning opportunities that define high-quality CTE, partnerships can also inform the development, review, and refinement of program curriculum and resources, as well as standards for technical skills. The challenge for schools and districts is to establish and maintain business and community partnerships that truly enhance students' learning and that are mutually beneficial to CTE programs and partners alike.

The ACTE framework provides an extensive set of criteria for characterizing effective partnerships among districts and business and community partners. Thematically, these criteria cohere around the importance of a structured, formalized coordination of partner contributions to the program; ongoing partner engagement with efforts to improve and sustain programs of study; and ongoing bidirectional outreach and advocacy by districts and their partners.

Unsurprisingly, the emphasis on business and community partnerships extends beyond the ACTE quality framework. As ACTE notes in its resource "Defining Quality: Business and Community Partnerships," such partnerships are so essential to program success that "federal, state and local policies, as well as standards and frameworks that consider CTE quality, have all recognized that partnerships are integral to delivering high-quality CTE."[34]

ExcelinEd, with an emphasis on how partnerships can improve CTE career pathways argues that "serious efforts to develop and strengthen career pathways for secondary students share a common challenge: developing cross-sector partnerships among K-12 education, business and industry organizations and postsecondary institutions."[35]

These partnerships take on a wide range of forms and intensities from ongoing, hand-in-glove relationships—in which partners may provide financial support, student opportunities and instruction, and curriculum review—to more occasional and less intensive engagements (such as one off job-shadowing or guest appearances).

[34]"Defining Quality: Business andCommunity Partnerships," **https://www.acteonline.org/wp-content/uploads/2019/03/HQ_Partnerships_March2019.pdf**

[35]"Building Cross-Sector Partnerships to Support Career and Technical Education Pathways," **https://www.excelined.org/wp-content/uploads/2018/05/ExcelinEd.CTEPlaybook2.BuildingCrossSectorPartnerships.May2018.pdf**

### *ACTE Quality Framework Element: Business and Community Partnerships*

- **a.** Representatives of the program of study actively conduct outreach activities to develop partnerships to ensure the program of study is informed by employer and community needs.
- **b.** Partnerships are formed with a diverse range of stakeholders who represent differing perspectives, including employers from small, medium and large businesses; industry representatives; community, workforce and economic development agencies; and other education stakeholders.
- **c.** The program of study has a formalized, structured approach to coordinating partnerships, such as an advisory board or sector partnership.
- **d.** Partners ensure that the program of study meets current and future workforce demand and skill needs by: identifying, validating and reviewing curriculum; identifying appropriate assessments and recognized postsecondary credentials; evaluating facilities, equipment, technology and materials to ensure consistency with industry standards
- **e.** Partners support students' and teachers' extended learning by: identifying, providing and evaluating work-based learning experiences for students; participating in CTSO activities; for example, by serving as mentors and judges; offering opportunities, such as externships, for educators to stay current with industry-relevant knowledge and skills
- **f.** Partners support the program of study in tangible ways, such as by investing funds, providing in-kind support and/or helping raise external funds to meet program of study goals.
- **g.** Partners support program of study sustainability by advocating for and promoting the program of study.
- **h.** Partners help to evaluate the effectiveness of the program of study in preparing students for further education and careers.

Despite this variation, there are fundamental attributes that characterize effective partnerships. The ACTE quality framework criteria for business and community partnerships articulate these attributes in terms of their functional contribution to CTE programs of study. Similarly, ExcelinEd identifies the following five characteristics of cross-sector partnerships:[36]

- Convening Agency or Intermediary
- Clear Purpose and Established Protocols
- Purposeful Stakeholder Recruitment
- Mutual Benefit and Shared Value
- Open Lines of Communication
- Clear Stakeholder Roles and Responsibilities
- Process-Wide Success Metrics

The North Carolina State Board of Education frames effective partnerships in terms of their dynamics and how schools and districts can facilitate good partnerships. The recommendations, based on feedback from business/industry partners and which overlap at points with the ACTE criteria, include:[37]

- Engage partners
- Provide feedback or results of the partners work
- Develop a plan of action
- Provide a clear sense of direction
- Provide expectations of the group
- Develop attainable goals
- Partner with a diverse group that represents all stakeholders
- Deliver on action items
- Communicate effectively
- Define clear action steps

[36]"Building Cross-Sector Partnerships to Support Career and Technical Education Pathways," **https://www.excelined.org/wp-content/uploads/2018/05/ExcelinEd.CTEPlaybook2.BuildingCrossSectorPartnerships.May2018.pdf**

[37]"Developing High Quality CTE Programs through Business Engagement," **https://www.jcpsnc.org/uploaded/Documents/Departments/CTE/Developing_High_Quality_CTE_Programs_Through_Business_Engagement.pdf**

While these lists are not identical, four key points emerge consistently across both of them that should be the focus for relationships between schools and their business and community partners. These four points are:

- Developing and articulating a **clear purpose** for the work together.
- Having **clear goals** for their work, which may include measurable student outcomes, such as the number of students who will job shadow or participate in an internship, and/or the number of students who earn a specific credential or Career Pathway Endorsement.
- Establishing **clear responsibilities and expectations** of both business and community partners from the school and of the school from business as community partners. These responsibilities and expectations are supported with clear processes for critical aspects of engaging in collaboration with students, including but not limited to: securing guest speakers and mentors in classrooms. student placements in job shadowing and internships, background checks and other security procedures, transportation, and more.
- Recogzing that **effective, clear communication** is the foundation for all of the above to be successful.

# Summary

High-quality CTE is multidimensional and, crucially, the result of multilateral efforts and contributions. While definitions of CTE quality vary, in terms of what they emphasize and prioritize, at a fundamental level they are predicated on a combination of effective curriculum, instructional strategies and resources, and business and community partnerships. Each of these elements is essential to developing and sustaining high-quality CTE programs of study that provide students with the opportunities and supports that enable them to develop the skills and knowledge necessary for a chosen career or to succeed in a postsecondary program of study.

Key takeaways from this analysis are:

**Additional and ongoing research of high-quality practices in CTE is necessary.**

**Quality CTE curriculum is critical.** Quality CTE curriculum includes:

- Alignment to standards – both academic and industry.
- Work-based learning opportunities.
- Integration of academic and technical knowledge and skills.
- Diverse, accessible, and engaging Career and Technical Student Organizations.

**High-quality instructional strategies, practices, and resources are necessary in all CTE classrooms.** High-quality instruction requires:

- Standards, content, and skills that are relevant to students and to their futures in the workplace and society.
- Learning that occurs through students engaging in authentic, problem-based learning.
- Integration across traditional academic disciplines into complex, authentic scenarios.
- Collaboration among students and with business and community partners.
- Authentic assessment with meaningful feedback for students.

**Inclusion, access, and equity must be intentionally built-in to CTE programs.** Key aspects of ensuring inclusion, access, and equity are:

- Ensuring consistent and adequate levels of funding for everything from teachers and supplies to transportation and extra-curricular activities.
- Engaging students in actual experiences with a wide range of careers, including non-traditional careers, and providing students with opportunities to ask questions about the paths to those careers.
- Creating a sense of belonging and community with shared experiences, thoughtful language, and respectful relationships.

**Business and community partnerships are vital to high-quality CTE experiences.** Keys to successful business and community partnerships include:

- A focus on creating and sustaining long-term partnerships.
- Collaboratively developing shared goals between school districts and business and community partners.
- Committing to ongoing opportunities for two-way open and honest communication between business and community partners and school districts.

Each of these elements is essential to developing and sustaining high-quality CTE programs of study that provide students with the opportunities and supports that enable them to develop the skills and knowledge necessary for a chosen career or to succeed in a postsecondary program of study.

*High-Quality CTE: What the Literature Says About Standards, Curriculum, Instruction, and Partnerships* provides both the community of CTE educators in Illinois and the broader educational community in Illinois with direction in the following areas:

- **Curriculum, Instructional Materials, and Instructional Strategies** - Focus on authentic concepts, content, and skills that naturally integrate traditional academic skills into workplace settings and tasks; Provide all students with opportunities to engage in high-level critical thinking through these authentic learning experiences that require students to find and evaluate, synthesize, and apply information and skills to solve new challenges and problems.
- **Professional Learning** - Providing educators, including teachers, counselors, and administrators, with meaningful, accessible, ongoing, and authentic learning experiences around all of the above topics related to curriculum, instructional materials, and instructional strategies is critical to ensuring that those high quality CTE practices become a reality in classrooms and schools across Illinois. Professional learning should be designed and delivered in ways that allow for educators to reflect on their learning and to implement new strategies as part of the process. Additionally, it is critical that professional learning take place over a sustained period of multiple years in order to ensure that the learning opportunities are accessible to educators and districts throughout the state given limited time and resources.
- **Ongoing Research** - As outlined earlier, CTE instruction is an area requiring and primed for additional research. Illinois should approach the implementation of these strategies by also supporting ongoing research regarding effective CTE strategies to not only improve student learning and outcomes within Illinois but to improve learning forward nationally and globally as a result of the thoughtful and strategic efforts around professional learning, curriculum, and instructional materials and strategies. Particularly given the diverse students, schools, and districts across Illinois, such research conducted in Illinois on these efforts would go far in overcoming the lack of research generally around CTE best practices.

# Appendices

## Appendix A

List of Career and Technical Student Organizations (CTSOs)[38]

- Business Professionals of America
- DECA (Marketing, Finance, Hospitality and Management)
- Educators Rising
- Future Business Leaders of America-Phi Beta Lambda (FBLA-PBL)
- Family, Career and Community Leaders of America (FCCLA)
- FFA (Agriculture)
- HOSA-Future Health Professionals
- Science Olympiad
- SkillsUSA
- TSA (Technology Student Association)

The Illinois State Board of Education maintains its own official list of CTSOs, and this includes directions on how an organization can apply to become a recognized CTSO by ISBE.

[38]"National Coordinating Council for Career and Technical Student Organizations," **https://www.ctsos.org** and "College & Career: Career and Technical Student Organizations," **https://www.isbe.net/ctso**

## Appendix B

### THE NATIONAL BOARD FOR PROFESSIONAL TEACHING STANDARDS: CAREER AND TECHNICAL EDUCATION STANDARDS

This appendix excerpts the standards statements for CTE teachers published by The National Board for Professional Teaching Standards. The excerpted standards "serve as the basis for National Board Certification in CTE." While the National Board standards represent the characteristics of a high-quality teacher, these also provide a strong framework for understanding high-quality CTE instruction in the classroom setting. These standards have been included here to further that understanding and discussion of high-quality CTE instruction.[39]

**Standard I: Knowledge of Students**

Accomplished teachers have a rich, holistic understanding of who their students are as learners and individuals. They value their students' various learning styles and stages of development, and they create learning environments that differentiate instruction to meet the diverse needs of all students.

**Standard II: Responding to Diversity**

Accomplished teachers create learning environments characterized by fairness, equity, and a respect for diversity. They use inclusive teaching practices and advocate to ensure that all students receive a quality career and technical education.

**Standard III: Knowledge of Content**

Accomplished teachers utilize their technical and professional knowledge as well as their interdisciplinary and pedagogical skills to develop curricular objectives, design instruction, promote student learning, and facilitate student success within industry.

**Standard IV: Learning Environments and Instructional Practices**

Accomplished teachers design contextualized learning environments that foster critical thinking, creativity, leadership, teamwork, and communication skills while preparing students for postsecondary education and careers.

**Standard V: Assessment**

Accomplished teachers design and implement a variety of valid and reliable assessments that allow students to provide an authentic demonstration of their knowledge and skills and help them establish goals to guide their technical and professional development.

[39]"Career and Technical Education Standards," **https://www.nbpts.org/wp-content/uploads/2021/09/EAYA-CTE.pdf**

**Standard VI: Postsecondary Readiness**

Accomplished teachers facilitate career exploration and promote the acquisition of knowledge and skills so students can make informed career decisions that match their interests and aptitudes with the needs, expectations, and requirements of industry.

**Standard VII: Program Design and Management**

Accomplished teachers design and promote quality programs aligned with industry demands. They manage materials and resources to enrich their programs and sustain meaningful educational experiences for their students.

**Standard VIII: Partnerships and Collaborations**

Accomplished teachers collaborate with family, education, industry, and community partners to create challenging real-world opportunities and support networks that help students plan, develop, and achieve their career goals.

**Standard IX: Leadership in the Profession**

Accomplished teachers collaborate with stakeholders within their schools and communities to improve instruction, promote student learning, and advocate for their fields of expertise in education and related industries.

**Standard X: Reflective Practice**

Accomplished teachers reflect analytically throughout the instructional process, using multifaceted feedback to increase the efficacy of their teaching, strengthen its impact on student development, and model the significance of life-long learning.

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