

Approaches to Industry Alignment



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The *Carl D. Perkins Act of 2006* stresses the need for greater alignment between career and technical education (CTE) programs and industry. Aligning with industry is a CTE necessity. Because CTE programs prepare students for the world of work, CTE must continuously monitor and consciously reflect the workforce needs of industries in the regions they serve. As such, this is not the first such call-to-action in CTE's long history, nor will it be the last.

But what does it take for CTE to align with industry? What does it mean for a program to be aligned with industry?

Lack of clarity about these questions makes CTE stakeholders view industry alignment with some trepidation. Worse yet, it makes them vulnerable to arguments that a new industry alignment “miracle cure” is better than the approach they currently are using.

This brief addresses this problem by describing three approaches to industry alignment and the questions that need to be addressed around each. CTE programs can use this brief to:

- Determine ways to improve their industry alignment approach
- Plan a new industry alignment approach
- Compare industry alignment approaches to determine which one best fits their needs, resources, and constraints.

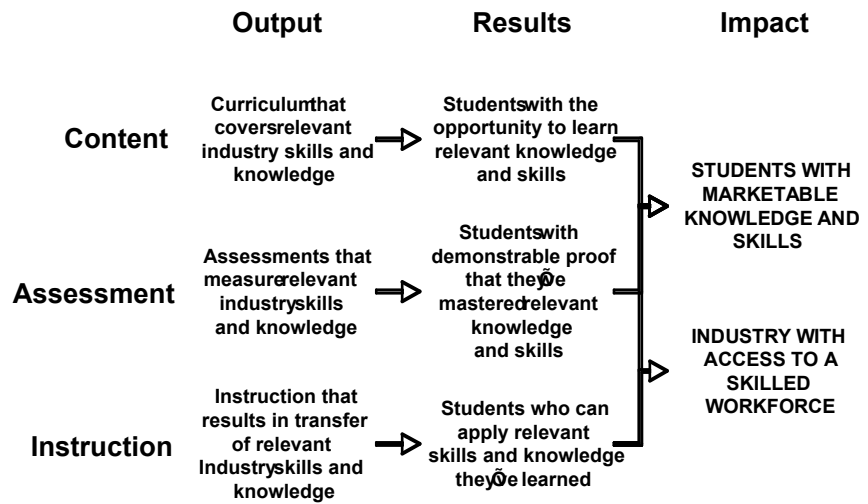
Feedback is welcome as the ideas here are applied and tested. For questions or comments, contact Joe Lualhati at jlualhati@gskillsxchange.com.

Three Industry Alignment Approaches

Aligning with industry essentially means designing curriculum “backwards.” It means using industry-relevant outcomes (i.e., student proficiency on industry-relevant knowledge and skills) to guide choices about curriculum. More precisely, aligning requires making sure that specific curriculum elements – content, instruction, and assessment – are designed and implemented with industry-relevant outcomes in mind.

The figure at right identifies three alignment approaches that are available to CTE programs. Programs can align with industry on 1) curriculum content, 2) student assessments, and 3) instructional methods. As the figure illustrates, impacts for students and industry are optimized when all three approaches are used and when they complement one another. It is only through the proper leveraging of all three approaches can programs fully deliver the industry-relevant outcomes both students and industry value – student proficiency on industry-relevant knowledge and skills.

Approaches to Industry Alignment



The first and most common alignment approach is based on curriculum content. This involves developing curriculum content that is tightly linked to industry-relevant outcomes. Effective use of this approach results in a curriculum that gives students the opportunity to learn industry-relevant knowledge and skills, and in turn, contributes to industry having access to a skilled workforce.

The second approach uses assessments to align with industry. At a minimum, this approach gives programs access to assessments that measure industry-relevant knowledge and skills. Programs can then use students' performance on assessments to gauge whether curriculum content and instruction are producing industry-relevant outcomes. Properly leveraged, this approach also allows programs to provide students with opportunities to gain industry-recognized credentials that allow students to prove to potential employers that they have mastered the knowledge and skills those employers care about. Whether programs realize these benefits, however, depends on their choice of assessments. And choosing the "right" assessment is not as easy as it seems.

The third approach uses instruction to facilitate alignment. This approach builds on a long line of research that says some instructional methods are better than others at transferring learning. Programs need to understand how their choice of instructional methods later affects students' ability to apply their knowledge and skills on the job.

The next three sections discuss the approaches in more detail. Each section presents a line of questions that any CTE program must address when using each approach. Three options accompany each question and summarize the different ways CTE programs can address these questions, along with the options' advantages and disadvantages. There is no "right" answer to these questions as different circumstances may require different answers. Stakeholders should use the framework to help determine what they might gain (or lose) by choosing one option versus another.

1) Using Content to Align with Industry

Curriculum content is the primary mechanism for aligning with industry. A CTE program needs first and foremost to provide students with opportunities to learn industry-relevant knowledge and skills. To do so, they need to base curriculum content on documentation of industry’s knowledge and skill requirements. In other words, curricula should be based on *standards*. A program’s choice of standards is critical. The table below presents key questions about standards including the informative value of different types of standards, and industry’s involvement in developing and reviewing them.

Using standards to develop curriculum content, although necessary, is but the first step in using content to align with industry. Programs also need to ensure that the resulting curriculum truly meets industry’s needs, is implemented as designed and is kept up-to-date so it can keep pace with industry’s rapidly changing needs. The table below also presents key questions about these topic areas.

Finally, keep in mind that while a focus on content is necessary, using only content to align with industry is not sufficient. This approach only provides students the opportunity to learn industry-relevant knowledge and skills. Proving that students actually have proficiency in those knowledge and skills requires the use of appropriate assessments. And students’ ability to apply their knowledge and skills depends on the instructional methods faculty members use to teach them.

Questions about Using Content to Align with Industry

Question	Option 1	Option 2	Option 3
<p><u>Standards Types</u></p> <p>What is used as the primary input for understanding industry’s requirements?</p>	<p>“CONTENT STANDARDS”</p> <p>Defines knowledge and skills students are expected to attain at different grade levels.</p> <p>PRO CON</p> <p>Makes it easy to develop curriculum across levels Defines proficiency in from education’s perspective</p>	<p>“PERFORMANCE STANDARDS”</p> <p>Defines knowledge and skills students are expected to master with respect to a certification.</p> <p>PRO CON</p> <p>Makes it easy to develop a curriculum that is aligned with a certification assessment Limits scope of knowledge and skills to those covered by the certification assessment</p>	<p>“SKILL STANDARDS”</p> <p>Defines tasks, knowledge, and skills relevant to a job, role, or occupational clusters.</p> <p>PRO CON</p> <p>Makes it easy to see how resulting curriculum links to the world-of-work Information may require additional effort to make it “education-friendly”</p>
<p><u>Standards Value</u></p> <p>What information is provided by the standards?</p>	<p>“CONTENT ONLY”</p> <p>Provides a list of knowledge and skill domains that needs to be covered</p> <p>PRO CON</p> <p>Allows for local interpretation. Allows for local interpretation.</p>	<p>“CONTENT AND OBJECTIVES”</p> <p>Provides a list of knowledge and skill domains and associated learning objectives</p> <p>PRO CON</p> <p>Makes it easy to develop curriculum content. Quality of content hinges on quality of learning objectives.</p>	<p>“CONTENT & PROFICIENCY LEVELS”</p> <p>Provides a list of knowledge and skill domains and levels of proficiency for each that is tied to successful task performance</p> <p>PRO CON</p> <p>Allows greater freedom to structure curriculum Output depends on curriculum design expertise</p>

<p><u>Standards Frame of Reference</u></p> <p>What is the standard's "frame of reference"?</p>	<p>"INDUSTRY-WIDE"</p> <p>Defines knowledge and skills relevant to an industry, as a whole</p> <p>PRO Makes it easy to cover "core" knowledge and skills relevant to an industry</p> <p>CON Resulting curriculum may be too general</p>	<p>"JOB- OR ROLE-SPECIFIC"</p> <p>Defines knowledge and skills relevant to a particular job or role, as a whole</p> <p>PRO Makes it easy for a curriculum to target a particular focus</p> <p>CON Requirements of a specific job-title or role may vary from one organization to another</p>	<p>"FUNCTION-SPECIFIC"</p> <p>Defines knowledge and skills relevant to functions associated with a particular job, role, or occupational cluster</p> <p>PRO Allows for a modular approach to curriculum development that can be used for different job/role profiles</p> <p>CON Requires more extensive planning with respect to program and curriculum design and development</p>
<p><u>Standards Updates</u></p> <p>What is the mechanism for "refreshing" standards?</p>	<p>"RESOURCE-DRIVEN"</p> <p>Standards are refreshed whenever there are resources available to do so.</p> <p>PRO Limits frequency of potential changes to curriculum</p> <p>CON May result in the use of outdated standards</p>	<p>"TIME-DRIVEN"</p> <p>Standards are refreshed periodically. Refresh schedule is driven by "owner" of standards.</p> <p>PRO Increased predictability of resources required to align with industry</p> <p>CON May result in the use of outdated standards</p>	<p>"EVENT-DRIVEN"</p> <p>Standards are refreshed whenever it is necessary.</p> <p>PRO Standards are continuously up-to-date (within reasons)</p> <p>CON May require program resources it doesn't have</p>
<p><u>Industry Role in Setting Standards</u></p> <p>What is the role of "industry" in setting standards?</p>	<p>"PARTICIPANT"</p> <p>"Industry" participates in standards development by providing thought leadership and subject matter expertise. Hence, the standards are based on input from industry members.</p> <p>PRO Standards reflect needs of participating industry members</p> <p>CON Participation dictates how well standards reflect industry needs</p>	<p>"SPONSOR"</p> <p>Standards are developed or set by an industry association. Hence, industry is presumed to sponsor the standards.</p> <p>PRO Standards are "industry-recognized"</p> <p>CON Recognition does not necessarily mean industry adoption</p>	<p>"PROPRIETARY"</p> <p>Standards reflect the needs of a particular industry members. Hence, the standards are based on the particular requirements of specific industry members.</p> <p>PRO Provides in-depth view of industry members' requirements</p> <p>CON Standards only reflect the particular members' requirements</p>
<p><u>Industry Review of Standards</u></p> <p>What is the role of local "industry" in reviewing "national" standards?</p>	<p>"ASSOCIATED"</p> <p>Standards are presumed to be applicable to local members of the "industry." Hence, there is no need to have local "industry" vet the standards.</p> <p>PRO No resources are needed for local validation of standards</p> <p>CON "National" standards may not exactly reflect workforce requirements of local "industry"</p>	<p>"REVIEWED"</p> <p>Members of a local industry advisory group review the standards for applicability to local conditions. Hence, a subset of local "industry" provides input to the relevance of the standards for local application.</p> <p>PRO Provides for an efficient way for vetting local applicability of "national" standards</p> <p>CON Output quality depends on who is part of the local industry advisory group</p>	<p>"CONTEXTUALIZED"</p> <p>Local industry members participate in a survey designed to gauge applicability of standards to local conditions.</p> <p>PRO Empirically clarifies applicability of "national" skill standards to local "industry"</p> <p>CON Requires program resources it may not have</p>

<p><u>Industry Acceptance of Curriculum</u></p> <p>What is the role of "industry" in "recognizing" curriculum based on standards?</p>	<p style="text-align: center;">"PRESUMED"</p> <p>Recognition is presumed because curriculum is based on industry standards.</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">PRO</td> <td style="text-align: center;">CON</td> </tr> <tr> <td>Curriculum development is under educators' control</td> <td>Quality of curriculum depends on internal expertise</td> </tr> </table>	PRO	CON	Curriculum development is under educators' control	Quality of curriculum depends on internal expertise	<p style="text-align: center;">"OVERT"</p> <p>Program employs recommended curriculum and/or learning materials that are "recognized" by industry.</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">PRO</td> <td style="text-align: center;">CON</td> </tr> <tr> <td>Makes it easy to provide programs that are aligned with standards</td> <td>Program depends on others for "quality"</td> </tr> </table>	PRO	CON	Makes it easy to provide programs that are aligned with standards	Program depends on others for "quality"	<p style="text-align: center;">"CERTIFIED"</p> <p>Program is certified by "industry" as meeting requirements of "industry."</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">PRO</td> <td style="text-align: center;">CON</td> </tr> <tr> <td>Program can market itself as recognized by industry</td> <td>Requires program to meet "certification" requirements</td> </tr> </table>	PRO	CON	Program can market itself as recognized by industry	Requires program to meet "certification" requirements
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<p><u>Industry Review of Curriculum</u></p> <p>What is the role of local "industry" in "reviewing" curriculum?</p>	<p style="text-align: center;">"LAGGING"</p> <p>Local "industry" does not play a role in reviewing curriculum. Hence, primary information local "industry" has about curriculum is based on quality of student graduating from program.</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">PRO</td> <td style="text-align: center;">CON</td> </tr> <tr> <td>Clear demarcation of industry's role vis-à-vis education</td> <td>Perceived "skill gaps" are easily attributed to program inadequacies</td> </tr> </table>	PRO	CON	Clear demarcation of industry's role vis-à-vis education	Perceived "skill gaps" are easily attributed to program inadequacies	<p style="text-align: center;">"LEADING"</p> <p>Local "industry" members review curriculum. Hence, program allows local "industry" a chance to provide feedback regarding curriculum.</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">PRO</td> <td style="text-align: center;">CON</td> </tr> <tr> <td>Workforce development becomes a joint responsibility of education and industry</td> <td>Requires education to work with industry members who may not have realistic expectations regarding education's role</td> </tr> </table>	PRO	CON	Workforce development becomes a joint responsibility of education and industry	Requires education to work with industry members who may not have realistic expectations regarding education's role	<p style="text-align: center;">"INTEGRATED"</p> <p>Program stakeholders and local "industry" members work together to ensure that program's curriculum and firm-specific training complement each other.</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">PRO</td> <td style="text-align: center;">CON</td> </tr> <tr> <td>Provides for greater clarity of roles and responsibilities with respect to workforce development</td> <td>May not be realistic and may result in compromising education's mission</td> </tr> </table>	PRO	CON	Provides for greater clarity of roles and responsibilities with respect to workforce development	May not be realistic and may result in compromising education's mission
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<p><u>Faculty Involvement in Curriculum</u></p> <p>How involved are faculty members in developing curriculum they will teach?</p>	<p style="text-align: center;">"HANDS OFF"</p> <p>Those who teach the curriculum are not involved in the design and development of the curriculum.</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">PRO</td> <td style="text-align: center;">CON</td> </tr> <tr> <td>Potentially streamlines the curriculum design and development process</td> <td>What is covered in class may be different from what a curriculum is intended to cover</td> </tr> </table>	PRO	CON	Potentially streamlines the curriculum design and development process	What is covered in class may be different from what a curriculum is intended to cover	<p style="text-align: center;">"ADVISOR"</p> <p>Those who teach the curriculum provide advice on curriculum design and development.</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">PRO</td> <td style="text-align: center;">CON</td> </tr> <tr> <td>Greater likelihood that what is intended to be covered and what is covered are in sync</td> <td>Need to coordinate potentially different "advice" can result in lengthening the process or it can result in a "generic" curriculum to ensure it meets everyone's expectations</td> </tr> </table>	PRO	CON	Greater likelihood that what is intended to be covered and what is covered are in sync	Need to coordinate potentially different "advice" can result in lengthening the process or it can result in a "generic" curriculum to ensure it meets everyone's expectations	<p style="text-align: center;">"PRODUCER"</p> <p>Those who teach the curriculum design and develop the curriculum.</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">PRO</td> <td style="text-align: center;">CON</td> </tr> <tr> <td>Ensures that the curriculum will be implemented as designed</td> <td>Potential that the curriculum will only cover materials that faculty members want to cover</td> </tr> </table>	PRO	CON	Ensures that the curriculum will be implemented as designed	Potential that the curriculum will only cover materials that faculty members want to cover
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<p><u>Curriculum Updates</u></p> <p>How often is curriculum updated?</p>	<p style="text-align: center;">"RESOURCE-BASED"</p> <p>Curriculum is updated whenever resources are available to do so.</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">PRO</td> <td style="text-align: center;">CON</td> </tr> <tr> <td>Limits frequency of potential changes to curriculum</td> <td>May result in the outdated curriculum</td> </tr> </table>	PRO	CON	Limits frequency of potential changes to curriculum	May result in the outdated curriculum	<p style="text-align: center;">"POLICY-DRIVEN"</p> <p>Curriculum is updated periodically per established local or state policy.</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">PRO</td> <td></td> </tr> <tr> <td>Changes in curriculum is in line with policy</td> <td></td> </tr> </table>	PRO		Changes in curriculum is in line with policy		<p style="text-align: center;">"NEEDS-BASED"</p> <p>Curriculum is updated whenever underlying standard is refreshed.</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">PRO</td> <td style="text-align: center;">CON</td> </tr> <tr> <td>Limits frequency of potential changes to curriculum</td> <td>May result in the outdated curriculum</td> </tr> </table>	PRO	CON	Limits frequency of potential changes to curriculum	May result in the outdated curriculum
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2) Using Assessments to Align with Industry

The **Perkins Act of 2006** calls for CTE programs to use assessments aligned with industry standards to gauge students' technical skill proficiencies. The logic here is clear. Using assessments to promote accountability ensures that programs are designed and delivered so that students gain proficiency in knowledge and skills they need to successfully pursue the careers they want. And, depending on a program's assessment choices, it offers students a way to demonstrate to potential employers that they've mastered the very knowledge and skills that employers are seeking.

But not all assessments are created equal. An assessment that fits the need of one program may not fit that of another. And some may facilitate greater alignment with industry than others. Simply put, choosing the "right" assessment is not an easy task.

There are three criteria for choosing assessments. The table on the next three pages presents key questions about each.

The first criterion is whether an assessment is appropriate for a particular program. Appropriateness here is defined as how easily the assessment can be integrated into a program.

The second criterion is the assessment's impact on a program's curriculum. Although the logic is that a program's use of an assessment will promote positive changes to the curriculum's content, this may not necessarily be the case. The potential exists that a program's assessment choice may actually adversely affect curriculum content alignment with industry standards. This can occur if the scope of knowledge and skills an assessment covers does not fully reflect what industry requires. Similarly, assessment choices can negatively affect a program's instructional methods. If an assessment covers terminologies, definitions and concepts, this may result in programs solely using instructional methods that are appropriate for teaching this level of knowledge but that fall short in promoting learning transfer.

The third criterion deals with the role industry plays in designing, developing and reviewing the assessment under consideration. It also calls into question the extent to which industry has adopted the assessment for use. This criterion is a key provision of the **Perkins Act of 2006**. Using assessments to align with industry will only succeed if industry is "involved" with the assessment in some tangible way.

Again, CTE programs can use the key questions that follow to guide choices about assessments so that those assessments can be used most effectively to align with industry. Also, CTE programs can use these key questions to guide their decisions regarding how to best comply with **Perkins Act of 2006** and not fall prey to the adverse impact of choosing the "wrong" assessment.

Questions about Using Assessments to Align with Industry

Question	Option 1	Option 2	Option 3
<p style="text-align: center;">“BRONZE-LEVEL”</p> <p>Assessment tools such as “skills checklist” that rely on judgments about students’ technical skill proficiencies.</p> <p style="text-align: center;">PRO CON</p> <p>Does not require much technical expertise to design, develop, and implement</p> <p>Open to potential biases and errors that could lend assessment results meaningless</p>	<p style="text-align: center;">“SILVER-LEVEL”</p> <p>Locally- or 3rd-party developed (and state-approved) assessment tools that are based on “industry” standards.</p> <p style="text-align: center;">PRO CON</p> <p>Locally developed assessments allow for tailoring of assessments to local conditions. And 3rd-party assessments allow for cost-effective use of assessments in programs</p> <p>Although assessment may result in a “certificate,” “industry” may not recognize or value the certificate</p>	<p style="text-align: center;">“GOLD-LEVEL”</p> <p>Assessment tools that result in “industry-recognized” credentials.</p> <p style="text-align: center;">PRO CON</p> <p>Results in “industry-recognized” credentials</p> <p>Although “industry-recognized,” local employers may not value or use the certification for “pay-affecting” purposes</p>	
<p style="text-align: center;">“STUDENT PREREQUISITES”</p> <p>Assessment requires students to meet experience, education, and/or certification requirements in order to either have the opportunity to take the assessment or receive “credential” associated with the assessment.</p> <p style="text-align: center;">PRO CON</p> <p>Looks at “mastery” of knowledge and skill domains using a “whole person” concept</p> <p>Becomes cumbersome for students and may not fit program’s need for an assessment</p>	<p style="text-align: center;">“PROGRAM REQUIREMENTS”</p> <p>Use of assessment may require program to obtain materials, equipment, and facility to properly teach students knowledge and skills covered by assessment. This includes potential need for instructors and the program to be “certified.”</p> <p style="text-align: center;">PRO CON</p> <p>Provides a mechanism for establishing that the program is of “quality”</p> <p>Requires resources the program may not have</p>	<p style="text-align: center;">“NO REQUIREMENTS”</p> <p>Use of assessment does not entail “student prerequisites” or require programs to make “structural” changes.</p> <p style="text-align: center;">PRO CON</p> <p>Assessment can be easily integrated into program</p> <p>May only be testing basic knowledge (i.e., “know that”) instead of relevant skills</p>	
<p style="text-align: center;">“LOW STAKES”</p> <p>The assessment was developed for diagnostic purposes only and does not have predefined standards of proficiency.</p> <p style="text-align: center;">PRO CON</p> <p>Allows program to evaluate the effectiveness of the program and/or how well students are gaining skills and knowledge covered by program</p> <p>Lack of predefined standards of proficiency (tied to external criteria) makes it difficult to judge whether or not assessment results are meaningful beyond intended purpose</p>	<p style="text-align: center;">“MODERATE STAKES”</p> <p>The assessment was developed to “certify” that students have met predefined standards of proficiency <u>but</u> is not appropriate for “pay-affecting” decisions.</p> <p style="text-align: center;">PRO CON</p> <p>Assessment is linked to predefined standards of proficiency (tied to external criteria)</p> <p>Results may not be valid for any other purpose except to serve as an accountability measure</p>	<p style="text-align: center;">“HIGH STAKES”</p> <p>The assessment was developed to “certify” that students have met predefined standards of proficiency <u>and</u> can be used for “pay-affecting” decisions.</p> <p style="text-align: center;">PRO CON</p> <p>Assessment results have meaning for potential employers who may want to use it</p> <p>Provides a false sense that assessment results are actually being used by industry</p>	
<p style="text-align: center;">“ASSESSMENT TYPES”</p> <p>What assessments are under consideration?</p>			
<p style="text-align: center;">“ASSESSMENT REQUIREMENTS”</p> <p>What are the requirements for using the assessment?</p>			
<p style="text-align: center;">“ASSESSMENT PURPOSE”</p> <p>For what purpose is the assessment developed?</p>			

<p><u>Assessment Quality</u></p> <p>Is the assessment a “quality” assessment?</p>	<p>“MARKETING-DRIVEN”</p> <p>The assessment purports to be developed and validated using professional guidelines, but no documentation exists regarding how the assessment is developed.</p> <p>PRO Reputation of assessment source serves as efficient way to judge “quality” of assessment</p> <p>CON There is no way to independently judge whether or not the assessment is of “quality”</p>	<p>“BUYER BEWARE”</p> <p>Potential user of the assessment has access to report on how the assessment was developed and validated.</p> <p>PRO Documentation exists that speaks to the “quality” of the assessment</p> <p>CON Review of documentation requires expertise a program may not have</p>	<p>“ACCREDITED”</p> <p>The assessment meets external quality standards and has been accredited by a 3rd-party (such as ANSI and NOCA).</p> <p>PRO Accreditation from a trusted 3rd-party serves as an efficient and effective indicator of assessment’s “quality”</p> <p>CON Accreditation is voluntary. Not having accreditation does not mean the assessment is not of “quality”</p>
<p><u>Assessment Use</u></p> <p>How are assessments going to be used?</p>	<p>“ACCOUNTABILITY”</p> <p>Use of assessments allows for determination of progress towards specific targets that inform performance-based decisions.</p> <p>PRO Fosters clear expectations and definitions of program success; no surprises</p> <p>CON Can encourage a “teaching to the test” mentality</p>	<p>“SUPPORT”</p> <p>Assessments are used to diagnose and track student progress towards meeting “industry” standards and to identify possible corrections.</p> <p>PRO Allows programs to use assessments to help instructors assist students meet “industry” standards</p> <p>CON Program may not be ready to implement a “student-centered” program; may be overwhelm program resources</p>	<p>“BRIDGE”</p> <p>Assessments are used to bridge educational programs and to bridge education with industry.</p> <p>PRO Fosters clear guidelines for articulation between CTE programs; allows for clear metrics of what a “skilled” workforce needs to have</p> <p>CON Will be of benefit only if articulation agreements exist and if local employers use assessment results for “pay-affecting” decisions</p>
<p><u>Assessment Impact</u></p> <p>What is the impact of using assessments on curriculum?</p>	<p>“EASILY INTEGRATED”</p> <p>Use of assessments has minimal impact on current curriculum.</p> <p>PRO Use of assessment is straightforward and does not require any changes on current curriculum</p> <p>CON Although this may serve as proof that curriculum is up-to-date, it also may be the case that the assessment is not up-to-date</p>	<p>“CHANGE NECESSARY”</p> <p>Use of assessment will require a curriculum shift.</p> <p>PRO Provides program an opportunity to refresh its curriculum</p> <p>CON May require resources the program doesn’t have; there is a potential that the change may not result in a “better” curriculum</p>	<p>“CROSS LEVEL INTEGRATION”</p> <p>Use of assessment will require different levels of a program study to be highly integrated.</p> <p>PRO Calls for a cross level program of study to be tightly linked</p> <p>CON Students at one level may not benefit from the use of the assessment unless they move forward to the next level</p>
<p><u>Assessment Updates</u></p> <p>How often is the assessment updated?</p>	<p>“NO PATTERN”</p> <p>No pattern exists for updating assessment.</p> <p>PRO Limits changes to curriculum</p> <p>CON May be outdated</p>	<p>“PERIODIC”</p> <p>“Standards” and assessment are periodically refreshed.</p> <p>PRO Predictable need for potential changes.</p> <p>CON Period may not be in pace with change</p>	<p>“NEEDS-BASED”</p> <p>Continuous monitoring of need to refresh assessment.</p> <p>PRO Keeps up with pace of change</p> <p>CON May require frequent program adjustment</p>

<p><u>Assessment Link to Curriculum</u></p> <p>What information is available about assessments that can be used for curriculum design and development?¹</p>	<p align="center">"TEST BLUEPRINT"</p> <p>Only information is a test blueprint that lists knowledge and skill domains measured by the assessment.</p> <p>PRO Allows for local interpretation</p> <p>CON Allows for local interpretation</p>	<p align="center">"OBJECTIVES"</p> <p>Information about assessment includes assessment objectives for each of the knowledge and skill domains measured by the assessment.</p> <p>PRO Assessment objectives can be easily translated into learning objectives</p> <p>CON Can encourage a "teaching to the test" mentality</p>	<p align="center">"STANDARDS"</p> <p>Information about assessment includes "standards" that lists tasks, knowledge, and skills that served as basis for development of test blueprint and objectives.</p> <p>PRO Provides clear view of the intended audience, purpose, and scope of the assessment</p> <p>CON Requires curriculum design and development expertise to produce a curriculum that is based on "standards"</p>
<p><u>Industry Role in Developing Assessment</u></p> <p>What role does "industry" play in the assessment design and development process?</p>	<p align="center">"ONE-OFF"</p> <p>"Industry" is involved in the design and development of the standards that serve as the basis for the assessment.</p> <p>PRO Assessment is aligned with "industry" standards</p> <p>CON The resulting assessment may not necessarily reflect what industry wants</p>	<p align="center">"INVOLVED"</p> <p>"Industry" participated in the design and development of both the standards and the assessment</p> <p>PRO "Industry" participation ensures that assessment meets its need.</p> <p>CON Participation is not "recognition"</p>	<p align="center">"SOURCE"</p> <p>"Industry" is the source of the assessment.</p> <p>PRO The assessment is recognized by "industry"</p> <p>CON Recognition is not adoption.</p>
<p><u>Industry Role in Reviewing Assessment</u></p> <p>What is the role of "local industry" in reviewing the assessment?</p>	<p align="center">"PROVIDES INPUT"</p> <p>"Local Industry" is involved in reviewing and providing feedback about the applicability of the assessment.</p> <p>PRO Assessment is aligned with "local industry" needs</p> <p>CON The resulting assessment may not necessarily reflect</p>	<p align="center">"SETS BAR"</p> <p>Local "Industry" reviewed the assessment and is involved in determining qualification score for the assessment.</p> <p>PRO Local "industry" participation ensures that assessment meets its need</p> <p>CON May not be possible for a number of available assessments</p>	<p align="center">"CHAMPION"</p> <p>Local "industry" is the one who identified the assessment.</p> <p>PRO Facilitates adoption of the assessment by local "industry"</p> <p>CON The assessment may not be appropriate for the program</p>
<p><u>Industry Adoption of Assessment</u></p> <p>What information is available that speaks to "industry" adoption of the assessment?</p>	<p align="center">"VENDOR PROVIDED"</p> <p>Information available is from the assessment vendor.</p> <p>PRO Information is easily accessible</p> <p>CON Vendor has vested interest in producing favorable information</p>	<p align="center">"THIRD-PARTY RESEARCH"</p> <p>Information is available from a third-party that speaks to adoption of assessment by "industry."</p> <p>PRO Third-party as a source lends "credibility" to the information</p> <p>CON Not available for most assessments</p>	<p align="center">"PRIMARY RESEARCH"</p> <p>Information is based on own systematic research of assessment adoption <u>or</u> is based on direct knowledge of a critical number of employers who use the assessment</p> <p>PRO Direct knowledge of employer use bolsters argument for assessment</p> <p>CON Requires resources program may not have</p>

¹Note: Regardless of which option is relevant to a program regarding this question, it behooves the program to use content-related key questions to gain greater insight into the assessment being considered for use.

3) Using Instruction to Align with Industry

This approach builds on CTE programs' use of "learning-in-context" to facilitate learning of knowledge and skills. However, the focus is not just to facilitate learning, but also foster transfer of learning. It calls for greater use of instructional methods (e.g., scenario-based learning, active learning, project-based learning) that provide students the ability to generalize and apply what they've learned from one context to another. CTE programs that use instruction to align with industry increase the probability that students will perform at the levels industry expects. The table below offers questions about the role that industry plays in cultivating transfer of learning.

Questions about Using Instruction to Align with Industry

Question	Option 1	Option 2	Option 3
<p><u>Instructional Methods</u></p> <p>How is curriculum content taught?</p>	<p>"KNOW-WHAT AND KNOW-WHY"</p> <p>Approach focuses on discussion of "know-what" and examples of "know-why." Although this may include "hands-on" practice, the focus is to use "learning-in-context" methodology to gain a better understanding of "know-what" and "know-when."</p> <p>PRO Allows for mastery of declarative knowledge</p> <p>CON Research shows that this may not be sufficient to transfer learning into work environment</p>	<p>"KNOW-HOW"</p> <p>Approach also focuses on teaching students procedures and to practice "know-how." This approach entails the use of repetition to facilitate learning about tools, procedures, and practices. Different problems or scenarios are provided that requires the application of the same or similar "know-how."</p> <p>PRO Research shows this approach facilitates "near-transfer"</p> <p>CON Research shows what is learned may not transfer to situations different from those used to facilitate learning</p>	<p>"KNOW-WHEN"</p> <p>Approach also focuses on teaching students "when" know-what, know-why, and know-how are applicable. The approach entails providing students a greater appreciation of the various contexts for which learned knowledge and skills are applicable.</p> <p>PRO Research shows this approach provides the greatest opportunity for "far transfer"</p> <p>CON Difficult to implement; and resources may not be available to implement</p>
<p><u>Instructional Method Choices</u></p> <p>What drives the choice of instructional method?</p>	<p>"CONSTRAINTS"</p> <p>Choice of instructional methods is driven by constraints. Appropriate instructional methods have been identified, but can't be implemented due to constraints (i.e., lack of access to tools, equipment, and other resources).</p> <p>PRO Appropriate instructional methods have been identified</p> <p>CON Forces compromises that could affect transfer of learning</p>	<p>"CAPABILITIES"</p> <p>Choice of instructional methods is driven by faculty capabilities and motivation. This means that, to a certain extent, programs allow faculty to "choose" which instructional methods to use.</p> <p>PRO Allows faculty to use methods they are comfortable with; correctable if due to lack of capabilities</p> <p>CON Chosen method may not lead to transfer of learning; also results in variability in the quality of instruction</p>	<p>"CONTENT"</p> <p>Choice of instructional methods is driven by an understanding of which method facilitates both learning of content and transfer of learned content</p> <p>PRO Allows for complementary use of content and instruction to align with industry</p> <p>CON May require resources the program does not have</p>
<p><u>Industry Role in Instruction Choices</u></p> <p>How does "industry" influence instruction?</p>	<p>"STANDARDS-BASED"</p> <p>Through "standards" that provides sufficient information about the contexts of work.</p> <p>PRO Facilitates curriculum that addresses transfer of learning</p> <p>CON May require capabilities and resources program does not have</p>	<p>"MATERIALS-DRIVEN"</p> <p>Through available materials that embed content in a number of different work contexts.</p> <p>PRO Makes design and development of curriculum more efficient, if not effective</p> <p>CON May not be available for most programs of study</p>	<p>"EXPERIENCE-DRIVEN"</p> <p>Through sponsorship of activities that allow students to experience various work contexts first-hand.</p> <p>PRO Makes what is being learned in class come "alive"</p> <p>CON Requires program to solicit assistance from "industry" partners</p>

Applying the Three Alignment Approaches

As shown above, aligning with industry calls for making sure that curriculum elements – content, instruction, and assessment – are designed and implemented to bring about industry-relevant outcomes (student proficiency on industry-relevant knowledge and skills). This means three things regarding the application of the three alignment approaches described in this brief.

1. Aligning with industry requires CTE programs to have core capabilities in both curriculum design and development and faculty development.

Curriculum design and development is critical because using content, instruction, or assessment to align with industry necessarily triggers the need for it. This is true if a CTE program wants to maximize its impact by leveraging all three approaches or if a CTE program only wants to use one of the three approaches.

Faculty development is critical to ensure that the curriculum is implemented as intended. CTE programs need to make sure that faculty members are up-to-date on the content, assessments, and instructional methods the curriculum is leveraging. Failure to address this may result in a major gap between the intent to align with industry and reality.

The final question below addresses the extent to which these core capabilities exist.

Question about Core Capabilities for Aligning with Industry

Question	Option 1	Option 2	Option 3
	“INDIVIDUAL CAPABILITY”	“BEST PRACTICE”	“MANAGED ACTIVITIES”
	Specific way for conducting core capabilities depends on who is assigned to carry out the activities.	Institution or program has identified and is using “best practices” for conducting core capabilities.	Institution or program ensures that core capabilities are being performed as intended <u>and</u> products meet pre-defined criteria.
	<p>PRO</p> <p>Activities are carried out by those capable of performing them</p>	<p>PRO</p> <p>Processes and procedures for conducting activities are standardized</p>	<p>PRO</p> <p>“Quality” is ensured through monitoring of both the conduct of activities and resulting products</p>
	<p>CON</p> <p>Different individuals may perform activities differently; hence, they result in products that vary with respect to certain criteria (such as quality, comprehensiveness, and so on)</p>	<p>CON</p> <p>Use of standardized procedures do not automatically mean “quality” products; can potentially result in “push-back” from stakeholders who want to use different ways to conduct activities</p>	<p>CON</p> <p>May become too rigid and inflexible</p>
<p><u>Core Capabilities</u></p> <p>To what extent are a program’s core capabilities “institutionalized?”</p>			

2. A CTE program that wants to maximize the impact of aligning with industry needs to apply all three alignment approaches.

Ideally, this means making sure first and foremost that the program's curriculum content is based on industry standards. This ensures that the curriculum content is tightly linked to outcomes industry values.

Next comes the choice of instructional methods. This choice needs to consider, not only which methods will facilitate learning of the defined content, but also which methods will facilitate the transfer of that learning. Use of the appropriate instructional methods allow students to take full advantage of the opportunity that aligned content offers them.

The final step is choosing the appropriate assessments. The choice of assessments needs to account for both a program's need to determine whether its content and instructional methods are resulting in industry-relevant outcomes, and students' need to prove to industry that they have gained the requisite knowledge and skills.

Hence, aligning with industry means making sure that industry standards are driving curriculum content and the resulting content, in turn, drives the choice of instructional methods and assessments. Pursuing industry alignment this way ensures that all three curriculum elements are working together to bring about industry-relevant outcomes.

What does this mean with respect to a CTE program's implementation of the assessment provision of the ***Perkins Act of 2006***?

It does not mean finding the assessment that can be easily integrated into the current program (unless the program's content is up-to-date and is already aligned with industry standards). And it does not mean that a CTE program needs to automatically use the assessment's content as the basis for its curriculum's content or instructional method. This approach may result in more harm than good.

It does mean viewing the Act's provision as an opportunity to review a CTE program's alignment with industry. It means using available assessments that are aligned with industry standards as a tool for gauging whether a program's content and instructional methods are designed and implemented to bring about industry-relevant outcomes. Then using existing industry standards relevant to a program to bridge any existing gap in content and/or instructional method. If the assessment is based on existing industry standards, integrating it into the resulting curriculum content should not be a problem.

3. The questions presented in the tables above represent key issues CTE programs need to address when aligning with industry using content, instruction, or assessment. Although there is no "right" answer to these questions as different circumstances may require different answers, not

having an answer to a question may reflect that a CTE program has yet to address this issue. In turn, this means that a CTE program may not be taking full advantage of its use of a particular alignment approach.

In addition, although different circumstances may mean different answers to these questions, some answers reflect the ideal situation better than others. The options for each question are arranged such that the right-most option, all else being equal, is the “ideal” option for addressing the question. It is the option that we hope a CTE program will “shoot for” because it provides the program the best opportunity to take full advantage of its use of a particular alignment approach.

In sum, this brief describes three ways that CTE can align with industry. Successful use of the three approaches will result in students with more marketable knowledge and skills and industry with better access to a skilled workforce.