

**Module 5**

Establishing High-Quality CTE Data Systems to Inform Decision-making

*Summer 2019*

Contents

[How to Use the Modules 3](#_Toc11611113)

[Getting Started 4](#_Toc11611114)

[Module Objectives and Pre-Module Survey 4](#_Toc11611115)

[Why Assess? 5](#_Toc11611116)

[Section 1: Determining Your State’s Data Needs 7](#_Toc11611117)

[Activity 8](#_Toc11611118)

[Annual Data Requests Checklist 9](#_Toc11611119)

[Section 2: Answering the Research Questions 10](#_Toc11611120)

[Deconstructing the Question 10](#_Toc11611121)

[Step 1: Selecting the Variables 10](#_Toc11611122)

[Step 2: Sourcing the Data 12](#_Toc11611123)

[Step 3: Constructing the Measure 14](#_Toc11611124)

[Section 3: Ensuring Data Quality 18](#_Toc11611125)

[Defining Data Elements 18](#_Toc11611126)

[Adopting Rigorous Data Collection Methods 20](#_Toc11611127)

[Creating Procedures for Analyzing Data 22](#_Toc11611128)

[Training Local Recipients on CTE Reporting 24](#_Toc11611129)

[Quality Assurance 25](#_Toc11611130)

[Final Reflections & Next Steps 28](#_Toc11611131)

[Post-Module Survey 28](#_Toc11611132)

[Next Steps 28](#_Toc11611133)

[Appendix A: Planning Chart 29](#_Toc11611134)

[Appendix B: Annual Data Requests Checklist 30](#_Toc11611135)

# How to Use the Modules

The New State CTE Director Leadership Program is designed to fit the natural learning curve of new State CTE Directors as they explore their state system for Career Technical Education (CTE) as well as the policies and decisions that undergird it. To that end, Advance CTE has developed a 12-month curriculum with two in-person meetings and monthly check-in calls to provide comprehensive supports to these new leaders. The program, with its curriculum, touch points and mentorship, is designed to allow new State Directors to access the support they need, when they need it.

///////////////////////////////////////////////////////// **Curriculum** \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\

* Strengthening Career and Technical Education for the 21st Century Act (Perkins V);
* CTE Programs of Study;
* Employer and Stakeholder Engagement;
* Data, Accountability and Evaluation; and
* Staffing and Management.

This curriculum is designed to help you be inquisitive about your state’s current “state of play” in CTE; evaluate the responses and information you gather; see what gaps exist; and determine if, how and when you may want to take action. By answering the guiding questions and adding data where appropriate, you will be able to better visualize both where your state is currently and where you want to take your state system.

The modules are laid out to help you organize your thoughts and guide effective discussions with your mentor and Advance CTE staff, who can help you consider and benchmark your findings, as well as provide resources, support and targeted technical assistance as you work your way through the modules.

*Disclaimer: The modules do not constitute or replace legal advice. We encourage you to check any relevant state and federal guidance and regulatory requirements to ensure compliance. Further, the examples listed within are not endorsements, nor should they be considered a comprehensive list.*

# Getting Started

## Module Objectives and Pre-Module Survey

Keep In Mind

As we work through this module, we will refer to the federal laws as Perkins IV and Perkins V:

* **Perkins IV**: Carl D. Perkins Career and Technical Education Act of 2006; and
* **Perkins V:** Strengthening Career and Technical Education for the 21st Century Act.

This module will help you to improve the quality and consistency of Career Technical Education (CTE) information maintained within your state’s educational administrative record system by assisting you in:

* Determining the types of data that your state should collect to describe and improve CTE programming at the secondary and postsecondary levels;
* Creating processes and tools to collect data that accurately reflect the status of local programs;
* Establishing analysis procedures that produce consistent, high-quality evaluations of programmatic initiatives and the performance of providers and students over time; and
* Locating examples of useful state practices for collecting and using CTE data to drive decision-making and support high-quality programs.

***Pre-module Survey***

To begin this module, please take this brief [self-assessment](https://www.surveymonkey.com/r/2018-19-new-sd-test).

Getting Started

## Why Assess?

Your position as State CTE Director offers you access to a storehouse of program- and student-level data that span secondary and postsecondary education and, in some cases, the education and workforce systems. Over the course of a given year, you will need to access these data for a variety of purposes, including reporting on federally legislated CTE indicators, establishing program policy and administrative guidance, and holding state and local providers accountable for their performance.

But your collection and analysis of CTE data should not stop there. You also can harness this information for your own strategic purposes and use it to drive your decision-making about where and how you allocate resources to achieve your state’s vision for CTE. Your data can also help you tell the story of CTE and give concrete examples about how CTE programs contribute to learners’ educational and career development. For these reasons, and many more, basing the decisions you make and information you share on accurate data is critical.

Proactive Thinking

*Using data effectively entails shifting from a compliance mindset to an improvement mindset. In other words, you should use data not to avoid consequences but rather to drive program growth and success.*

Although program guidance and financial support for CTE come from various sources, federal legislation has long influenced states’ delivery and assessment of CTE programming. The accountability provisions introduced in the Carl D. Perkins Career and Technical Education Act of 2006 (Perkins IV) and modified in the Strengthening Career and Technical Education for the 21st Century Act (Perkins V) have shaped the measures used to quantify state and local performance and dictated the characteristics of students who are assessed. If you are not careful, the high stakes associated with federal reporting can lead to a culture of compliance, which may lead you to prioritize federal accountability requirements over program improvement.

This module will support you in collecting high-quality data that can be used to strengthen program performance and communicate the benefits of CTE. We seek to offer a balanced approach to using data to meet federal requirements and drive program improvement. As such, this topic is split into two parts. Through the module, we will examine approaches to collecting and using CTE data, as well as steps to improve CTE data quality. Then on our monthly call, we will explore new requirements and expectations under Perkins V and your responsibilities as State Director. You can check out the recording of that call [here](https://advancecte.webex.com/ec3300/eventcenter/recording/recordAction.do?theAction=poprecord&siteurl=advancecte&entappname=url3300&internalRecordTicket=4832534b00000004209106196b8b2a5841622ee4a5f6ed7b6987bcdce44893836559b5cd21be6e6b&renewticket=0&isurlact=true&format=short&rnd=1979211596&RCID=35072cee2713581787fe942565ff8f2c&rID=18870467&needFilter=false&recordID=18870467&apiname=lsr.php&AT=pb&actappname=ec3300&&SP=EC&entactname=%2FnbrRecordingURL.do&actname=%2Feventcenter%2Fframe%2Fg.do).

**KEY TERMS AND DEFINTIONS**

Much of the CTE data contained within states’ administrative record systems is closely aligned with federal reporting requirements. Consequently, if you are new to CTE, you will want to first familiarize yourself with the terminology used in Perkins and other federal legislation so that you have a context for understanding your state’s measurement system. Some key terms that we will refer to in this module include:

* *Indicator —* a means of assessing the performance of a system. The core indicators identified in federal legislation are meant to provide a picture of how well states’ CTE systems are functioning.
* *Measure —* a critical performance outcome that you are seeking to quantify, such as the number of students who earn an industry-recognized credential or certificate.
* *Concentrator —* a student who has completed at least two courses in a single CTE program or program of study at the secondary level or a student who has earned at least 12 credits in a postsecondary CTE program or program of study (or has completed the program if it encompasses fewer than 12 credits). This term has historically been defined by the state, but Perkins V established a national definition.

# Section 1: Determining Your State’s Data Needs

In this module, we will walk though strategies you can use to:

* Track and manage your data reporting needs;
* Translate research questions into measures that produce quantifiable results;
* Collect and administer data elements to ensure that they are accurate and high quality; and
* Analyze data to produce comparable results year over year.

We also will point you in the direction of states that are using tools you might want to investigate further and offer some leading questions for reflection. We encourage you to consider using this time as a new State Director to be inquisitive — to reflect on your state’s current data processes and challenge status-quo assumptions.

**Managing CTE Data Requests**

As State Director, you oversee the collection of a substantial amount of data to address federal reporting requirements contained within Perkins, produce annual state reports on the status of program operations and outcomes, and respond to requests for information from various agencies and individuals. You also may be asked to report on the status of new programmatic initiatives that use CTE as an instructional strategy.

Keep in mind, however, that your responsibilities transcend compliance reporting. Your position offers you unique insights into the types of data that are needed to improve CTE offerings throughout your state. Therefore, in addition to responding to routine requests, you should be both proactive and strategic in identifying your own set of research questions that you would like to answer. Some of these questions may help you better prepare for Perkins V by understanding the nature of your state CTE system, the existence and extent of equity gaps in your state, and the quality and effectiveness of existing CTE programs.

To ensure that you have the data needed to respond to routine information requests, documenting the statistics you will need to produce on a regular basis and when these asks will occur can be helpful. Since arraying all of the research questions you and your staff will be asked to answer will be difficult in a single sitting, you can use the tools in this section to begin categorizing these requests. This effort will also help you gain a full view of the data you already collect and begin to identify gaps or questions you still wish to have answered to truly analyze the health of your CTE system.

Over time and with dedication and commitment, you will build out a comprehensive calendar of your office’s and your state’s specific data needs, such as federal reporting as well as information shared with stakeholders including districts, institutions, policymakers and the public. It can also assist in staff planning — for example, in distributing workloads or scheduling vacations.

It is important to recognize that the information you collect and data requirements will be dynamic. Changes in state policy and staffing, for example, may lead to new requests for data or enable you to cross off items no longer required. Consequently, you and your staff should agree to make regular updates to keep the list current and complete. One strategy is to create a shared file on your agency server to allow members of your team to help populate and curate the list and plan their time in anticipation of upcoming reports.

### Activity

Use the table below (also found in [Appendix B](#_Appendix_B:_Annual)) to catalog all of the data needs your office has throughout the year, with one page for each request. Be prepared to provide details on the:

* *Purpose of request* — Why are you producing this information? Is it for a federal report? To populate an annual state report card? To respond to a state legislative committee?
* *Source of request —* Who is making the request? Is this request to comply with federal reporting requirements? To produce data for a state department of education or labor report? Include contact information if applicable.
* *Research questions* — What specific questions do you need to answer? For example, is the request meant to document the high school or college graduation rate of CTE concentrators? To quantify the number of high school students earning dual credit in a CTE program of study? Keep in mind that a single request may include multiple questions.
* *Timing of request —* When is the request typically received, and when is a response required? If it is for a recurring report, when will the data need to be produced?
* *Priority —* How important is the request? Consider using a scale to denote its relative importance. For example, is the item used for high-stakes reporting, such as for federal Perkins accountability reporting? This context can help you to determine the amount of attention and review that you invest in its production.
* *Responsibility —* Which staff members are tasked with answering the identified questions? Are they aware of their ownership of the data?

## Annual Data Requests Checklist

**Report Name:**

|  |
| --- |
| *Purpose of Request* |
| *Source of Request* |
| *Research Questions* |
| *Timing of Request* |
| *Priority* (ranking 1 = lowest priority, 5 = highest priority) |
| *Responsibility* |

# Section 2: Answering the Research Questions

Once you understand what information is needed and when, you can use data to formulate responses as well as develop your own research questions. In this section, we will offer a checklist to help you translate research questions into indicators and frame metrics to supply answers. This work includes considering underlying issues associated with assessing outcomes, ranging from who is included in the measure to how the data are sourced.

If you read that first paragraph and your instinct was to immediately speed dial your analyst who handles all data questions, here is a reminder about why it is important for you — as State Director — to understand the nuances of your CTE accountability system. As an organizational leader, you are legally responsible for the information you report. You also are positioned to drive school improvement, and data are a critical component of this process. For this reason, it is imperative that you fully comprehend the processes used to collect, administer and analyze data. Because you have ultimate ownership of the data that will be used to answer research questions you cannot simply hand off responsibility to your staff.

## Deconstructing the Question

Every research question requires a unique set of data to answer. The following section reviews issues you will need to consider in developing measures, with the understanding that you may need to combine information from one or more measures to fully answer a question, as well as tackle the challenge of ensuring that the measures are based on quality, accurate data.

Logic Dictates

*If you do not understand the thinking behind the request, odds are, you will not produce an accurate response.*

Start by specifying what you want to know. If the request comes from outside your agency, you may need to consult with the agency or individual making the request to ensure that you fully understand his or her intent. Depending upon the specificity of the question, you may also need to seek additional guidance on the purpose of the analysis and how the results will be used.

To make this exercise useful, we suggest you select a critical report or commonly asked research question identified in Section 1 to contextualize your work. The expectation is that you will repeat this activity for each of the research questions you identified in that section.

### Step 1: Selecting the Variables

Once you have stated your research question, you can select the data elements (also referred to as variables) that you will include in your analysis. This step will typically require that you specify a given outcome, as well as the individuals within a given population that you will include in your analysis.

For example, consider the research question:

*What percentage of four-year graduates were CTE concentrators?*

Here you will need to identify a diverse set of data elements that include:

* *CTE concentrator —* students who met the state CTE course completion threshold;
* *Study population —* students who were eligible to be included in the four-year cohort; and
* *Four-year graduation —* indication of whether student did or did not graduate from school within four years.

Answering this question fully will require considering a range of additional factors. Because the CTE concentrator population is not a single construct, you may need to either narrow the question to address a specific sub-population — such as learners who are female and identify as Hispanic — or identify the different types of learners you would want to include in your analysis. Possible options could include:

* Gender;
* Race/ethnicity;
* Urbanicity;
* Non-traditional status;
* Special population status; and
* CTE program area.

As you work, keep in mind that variables are generic descriptors that are used in datasets to classify information. Because different cohorts of learners will have similar variables, it is critical that variable selection address the specific range of data to be analyzed. For example, if the request is to assess graduation rates ***in the reporting year,***then an additional field may be needed to specify the time frame for analysis:

*Academic year 2016-17 —* learners who entered ninth grade in the 2013-14 academic year

Finally, because collection may occur at different times, consideration must be given to when data will be available. For example, the employment outcomes of high school and college graduates typically are not assessed until the second quarter (six months) following their exit. Time also must be provided for data to be reported to state labor departments and undergo a quality assurance review, meaning that results for 2017-18 graduates will usually not be available until spring 2019.

Know the Data

*To construct accurate measures, understanding the nuances of your data, as well as any changes over time that may complicate using the data to tell a story, is essential.*



**State Example**

The [**Pennsylvania** Department of Education](http://www.education.pa.gov/Teachers%20-%20Administrators/PIMS/Pages/default.aspx) maintains a comprehensive website containing information on its statewide longitudinal data system (SLDS). The site includes resources that address CTE reporting and data. Among the resources offered for postsecondary educators are copies of the CTE student [Perkins IV User Manual](http://www.education.pa.gov/Documents/Teachers-Administrators/PIMS/PIMS%20Postsecondary/PIMS%20PS%20Perkins%202016-2017%20Data%20Submission/2016-17%20PIMS%20Perkins%20Postsecondary%20Manual%20-%20Volume%201.pdf), which includes a list of all of the data collected for CTE reporting and the business rules associated with their use.

***Key Questions***

Answer the questions below in the space provided. While these questions are all optional, we encourage   
you to capture your thoughts here so that you can easily refer back to them.

***Selecting the Variables***

|  |  |
| --- | --- |
| ***Key Questions*** | ***State Response*** |
| Looking back at the five research questions you identified in Section 1, can you identify the variables that you would need to have on hand to answer each one? |  |
| Where can educators, parents and others find information on the data elements that are available for CTE programming offered in your state? |  |

### Step 2: Sourcing the Data

Once you have selected your variables, the data you need may reside in a variety of locations. Data on student coursetaking, academic performance, attendance and other educational experiences typically will be housed in your state’s educational administrative record system. If so, your state agency may maintain a separate database containing CTE data. In this case, you will need to match data on CTE participants and concentrators to your state’s primary educational administrative record system, which can be done using your system’s unique student identifier. At the secondary level, this identifier will typically be a state-assigned educational identifier; at the postsecondary level, a student’s Social Security number (SSN) is usually used as a key. Note that some states do not allow for uniquely identifying information to be accessible at the state level.

Due to the nature of CTE programming, which includes programs of study that span secondary and postsecondary education, answering some research questions will require that you access data housed outside your educational system. For high school students, this work could entail tracking transitions into postsecondary education and/or employment, and for college students, it could include transitions from a two-year to four-year college or university and/or employment.

Establishing cross-sector data linkages is a challenge for many states. Advance CTE’s report [The State of Career Technical Education: Improving Data Quality and Effectiveness](https://careertech.org/resource/state-cte-improving-data-quality-effectiveness)looks at how states are collecting and using career readiness data.According to the report, only 49 percent of State Directors say their CTE data system is “mostly” or “fully” aligned with their secondary data systems, 28 percent with their postsecondary data systems and 18 percent with their workforce data systems.

As a result, many states rely on less than ideal methods for collecting data. For example, 61 percent of State Directors say they use surveys to collect information on workforce outcomes for secondary students, and 55 percent use surveys to measure further education and training. Using surveys to collect data on student outcomes is not a best practice for a number of reasons. Surveys are burdensome to administer consistently and reliably across a state, they are difficult to validate, and they often get low response rates. Consider other data sources that may help to tell a more nuanced story on CTE program completers.

In-state data sources may include:

* *State Unemployment Wage Record system* — employment outcomes and hourly earnings;
* *State licensing* — certification for state-supervised occupations;
* *Social services* — receipt of state benefits, such as unemployment or SNAP; and
* *Corrections* — incarceration in the state prison system.

Many states also have SLDSs, which link and house data across sectors. In some cases, you may be able to access secondary, postsecondary and workforce data for various learner populations directly from your SLDS, though the accessibility and reliability of longitudinal data vary from state to state.

External data sources may include:

* [*National Student Clearinghouse*](http://www.studentclearinghouse.org/) *—* enrollment in colleges or universities throughout the country;
* [*State Wage Interchange System*](https://www.doleta.gov/performance/swis.cfm) *—* employment outcomes and earnings in participating states (previously called the Wage Record Interchange System);
* *Industry certification providers —* professional associations offering industry-recognized credentials or certificates;
* *Department of Defense —* military enlistments; and
* *Office of Personnel Management —* federal employment.

Memoranda of understanding (MOUs) may be necessary to overcome barriers to accessing data across agency databases. These documents spell out the purposes of the data request, the process that will be used to access information, who has access to data and for how long, and the steps that will be taken to protect student confidentiality.



**State Examples**

The **Wisconsin** Technical College System has created a [Perkins Data Workflow document](https://cte.careertech.org/sites/default/files/WI_Perkins-Data-Flow.pdf) that illustrates, in graphical form, the data reporting systems that feed into the system’s data warehouse. The document lays out the flow of data from sources to system and how it is harnessed to address the indicators of performance. The chart offers a visual representation to help staff and the public understand how data are harnessed to report on system outcomes.

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The **Washington** State Workforce Training and Education Coordinating Board maintains [documentation](https://cte.careertech.org/sites/default/files/WA-Data-Warehouse.docx) of the workforce-related databases and tables stored on the agency’s server related to the employment and further education of program participants. The documentation includes information on databases and programming files used to construct reports on postsecondary CTE as well as other workforce development systems programs. The state also provides a [Perkins workflow chart](https://cte.careertech.org/sites/default/files/WA_Perkins-Reporting-Flow.pdf).

In **Iowa**, the secondary and postsecondary sectors use the same unique identifiers for individuals in the public education system, making data matching much easier to facilitate. The Iowa Department of Education has also established partnerships to obtain data from other data sources. Through a partnership with the National Student Clearinghouse, Iowa can track learners who are in further education within the state, as well as across state lines. The Department of Education has also established an MOU with the Iowa Workforce Development agency to receive wage and employment data for CTE graduates.

***Key Questions***

Answer the questions below in the space provided. While these questions are all optional, we encourage   
you to capture your thoughts here so that you can easily refer back to them.

***Sourcing the Data***

|  |  |
| --- | --- |
| ***Key Questions*** | ***State Response*** |
| Which in-state data sources are you currently accessing to support your reporting? |  |
| Which external data sources are you currently accessing to support your CTE reporting? |  |
| What processes are in place to ensure that the data that you receive from your in-state or external sources are accurate? |  |
| What impediments do you face in accessing data to support your CTE reporting, and how can you overcome these barriers? |  |

### Step 3: Constructing the Measure

Once you have identified the variables and sourced the data, you will need to construct measures to assess student performance. To do so, you will need to specify numerators and denominators that include counts of the numbers of students who meet specific conditions. In doing so, you should seek to provide as much detail as possible.

* **Numerator:** the number of individuals who have met the criteria of study
* **Denominator:** the number of individuals eligible for inclusion in the measure

Ideally, the measure will specify, in writing, all of the information required to calculate the indicator. This specificity will help to ensure that future analyses will be reliable, meaning that results are consistent across years. You may also wish to share measure constructions with data requestors to confirm that the metric you are proposing captures the intended outcomes, which can help to ensure that results are valid, meaning that they actually measure what they are intended to assess.

Increasingly, states are building measures of career readiness into their state and federal accountability systems for K-12 education, most commonly through the Every Student Succeeds Act’s (ESSA) School Quality and Student Success Indicator. In 2019 Advance CTE partnered with Education Strategy Group, Achieve and the Council of Chief State School Officers to produce a [report](https://careertech.org/resource/making-career-readiness-count-2019) summarizing states’ approaches to assessing career readiness. The report finds that 40 states have built measures of career readiness into their state or federal K-12 accountability systems. The report includes examples of state measurement approaches and a state-by-state listing of accountability measures.

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**State Example**

**Colorado** produces an annual [CTE Fact Sheet](http://coloradostateplan.com/wp-content/uploads/2019/03/CTE_Fact_Sheet_2019_final.pdf) that offers student participation and outcome data for secondary and postsecondary programming. To help school districts and colleges interpret the statistics, the state has developed a document that defines key terms and explains how the measures are constructed. Educators may use the tool to help develop their own fact sheets for their CTE programs.

***Key Questions***

Answer the questions below in the space provided. While these questions are all optional, we encourage   
you to capture your thoughts here so that you can easily refer back to them.

***Constructing the Measure***

|  |  |
| --- | --- |
| ***Key Questions*** | ***State Response*** |
| Does your state currently collect data on each of the variables that you will need to answer the identified research question? If not, are there proxies that you may use to approximate the data? |  |
| What procedures must you follow to add new data elements to your state’s educational administrative record system? |  |
| Does your state have a unique identifier that can be used to collect information across state agencies? If so, how comprehensive is its coverage (i.e., historically, what percentage of students have you been able to track using the identifier)? |  |
| Does your state have MOUs in place with each agency data holder, and if so, when was the last time they were updated? |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | |  | | --- | | Answering Research Questions: Checklist | |  | |

Research Question:

**Step 1: Selecting the Variables**

|  |  |
| --- | --- |
| ☐ | Who should be included in the measure? Possible disaggregates could include: |
|  | * + - * Gender;       * Race/ethnicity;       * Non-traditional status;       * Special population status;       * CTE program area; and       * Urbanicity. |
| ☐ | What are the data elements you will need to conduct your analysis? |
| ☐ | What years of data should be included? |

**Step 2: Sourcing the Data**

|  |  |
| --- | --- |
| ☐ | Where do the data reside (i.e., whom will you need to contact to access the data)? |
| ☐ | Is a memorandum of understanding required? If so, where can it be found? |

|  |  |
| --- | --- |
|  |  |

**Step 3: Constructing the Measure**

|  |  |
| --- | --- |
| ☐ | Numerator: the number of individuals who have met the criteria of study |
| ☐ | Denominator: the number of individuals eligible for inclusion in the indicator |

# Section 3: Ensuring Data Quality

When it comes to assessing CTE performance, in most cases, you will likely rely on data analysts — staff located in your unit or the broader agency — who have primary responsibility for collecting and analyzing data. Consequently, you will likely delegate much of the day-to-day operations of your state’s CTE data and accountability system.

Garbage In, Garbage Out

*If data are not entered correctly into administrative data systems at the outset, then all of the findings produced with them will be inaccurate.*

Ultimately, the outcomes you report on CTE programming depend on the quality of the data used to produce them. That is why it is critical that you have a clear understanding of how your state’s data and accountability system functions and a well-documented process for safeguarding data quality. The following section identifies key components of a well-designed data system to help you understand what you need to know about your system structure, using state examples to illustrate concepts.

One helpful resource is Advance CTE’s [The State of Career Technical Education: Improving Data Quality and Effectiveness](https://careertech.org/resource/state-cte-improving-data-quality-effectiveness). This report draws on a national survey of State Directors to answer critical questions about the quality of state CTE data systems and how data are being used. The report finds that states are hesitant to use their data for high-stakes decision-making; that CTE data systems are not sufficiently aligned across the secondary, postsecondary and workforce sectors; and that many states rely on self-reported measures of career readiness and do not often use rigorous validation processes.

## Defining Data Elements

A data dictionary arrays the variables that make up your accountability system. Simply put, it defines the vocabulary and grammar of your state’s data. A well-constructed data dictionary includes descriptions of:

* *Element name* — a short (typically one- to three-word) description of the variable;
* *Element definition —* a brief (typically one- to two-sentence) explanation of the element and its purpose;
* *Variable codes* — a list of the possible values a variable may take;
* *Variable type —* identification of format (numeric or alphanumeric);
* *Variable length —* indication of the number of characters included in the field;
* *Source —* where the variable may be accessed;
* *History —* information on when the variable was adopted or decommissioned; and
* *Notes —* special instructions or background information.

With the advent of SLDSs, many states have integrated their CTE data elements into their comprehensive education database, though some continue to maintain separate dictionaries. Irrespective of how your data are coded, it is imperative that you and your staff understand how each of the CTE data elements is defined to ensure that it is structured to provide the information you need to comply with federal, state or other reporting.

Additionally, you should try as much as possible to adopt common definitions when secondary, postsecondary or workforce indicators are related — for example, “attainment of a recognized postsecondary credential,” which is a common measure for Perkins and the Workforce Innovation and Opportunity Act (WIOA) and one that many states are measuring to some degree through ESSA. Common definitions will allow you to compare similar measures across sectors, align planning and goal-setting and monitor statewide progress.

It is equally critical that local staff charged with entering data into their administrative record systems (used to populate the SLDS) or responsible for pulling CTE data from their systems to complete CTE reporting templates have a complete understanding of your state dictionary as it relates to CTE*.*

Do not automatically assume that local program staff understand the intricacies of CTE data. While many variables are similar across education systems (e.g., gender, race/ethnicity), CTE is a distinct program with unique jargon and concepts used to describe programs. The odds for mistakes happening are greater for CTE than for other educational programs. For this reason, pay close attention to the terminology and explanations used to define your CTE elements.



**State Examples**

**Florida** maintains an online [District Career & Adult Education Data Information System](http://www.fldoe.org/accountability/data-sys/CCTCMIS/dcae-dis/) that provides for the collection of CTE data from the state’s 67 school districts and for data quality checking and feedback. A set of database handbooks offers guidance on the reporting of CTE student data, with information including CTE data elements; associated notes; and descriptions of reporting formats, edits, timelines and supporting appendices.

**Nebraska** provides a detailed [postsecondary data dictionary](https://2x9dwr1yq1he1dw6623gg411-wpengine.netdna-ssl.com/wp-content/uploads/2017/07/POSTSECONDARY_7_0_0.pdf) to support its Nebraska Student Staff Record System.

The **New Jersey** Department of Education’s Office of Career Readiness is responsible for collecting CTE data from all public secondary school districts, county vocational school districts, and community colleges in the state. To help guide data collection, the state has created a set of downloadable [data dictionaries](http://www.nj.gov/education/cte/data/) that secondary and postsecondary CTE providers can consult when submitting data. The written documentation helps to improve the consistency of data across sites because all providers follow the same instructions when uploading CTE data.

•  **Purpose of request**—Why are your being asked to produce this information? Is it for a federal report? To populate an annual state report card? To respond to a state legislative committee?

•  **Source of request**—Who is making the request? Is this to comply with federal reporting requirements? To produce data for a state department of education or labor report? Include contact information if possible.

•  **Research questions**—What are the specific questions being asked? For example, is it to document the high school or college graduation rate of students who achieve a state threshold for CTE course taking? To quantify the number of high school students earning dual credit in a CTE program of study? Keep in mind that a single request may include multiple questions.

***Key Questions***

Answer the questions below in the space provided. While these questions are all optional, we encourage   
you to capture your thoughts here so that you can easily refer back to them.

***Defining Data Elements***

|  |  |
| --- | --- |
| ***Key Questions*** | ***State Response*** |
| Does your state have a CTE data dictionary in place? |  |
| Have you reviewed your data dictionary to ensure that all of the fields needed to administer data are included and are accurate? |  |
| How often is your data dictionary updated, and who is responsible for this process? |  |
| Do local providers have access to the dictionary, and if so, have they received training on how to enter data into their local systems or CTE reporting templates to ensure codings match the state’s? |  |
| Has the CTE data dictionary used in your state been cross-walked with other data dictionaries to ensure alignment and consistency? |  |

## Adopting Rigorous Data Collection Methods

As State Director, you need to trust your data to make high-stakes decisions and inform state policy. If you do not trust your data, making decisions that are in the best interest of learners is a lot harder.

One place to start is by looking at your statewide practices for collecting data. What guidance — if any — has your office provided to local leaders around collecting data? Are these practices being used consistently across the state, or is it more like the Wild West? How often do you audit local recipients’ data to ensure that they are valid?

Often, local schools and institutions — which have limited resources and time — rely on self-reported data to obtain information about learner achievement in CTE programs and after completion. This challenge surfaces most often when measuring post-program outcomes. The chart below shows that many states are using surveys to determine if graduates go on to further education or gainful employment.

Using surveys to collect information about learner outcomes is not a best practice. Surveys are subject to low response rates, they are burdensome to administer, and they are difficult to validate. A better approach is using administrative data on postsecondary enrollment and employment — information that is already available at the state level — to identify outcomes for CTE graduates. Accessing these data requires time, patience and strong cross-sector partnerships, but it is worth the effort if you can obtain reliable outcome data in a timely manner.

Overall, leveraging partnerships and aligning processes and protocols around data collection with other state agencies is advisable. Different sectors have different needs and uses for data, but these needs can overlap. If your state education agency is already collecting information on industry-recognized credential attainment for ESSA, you should not need to conduct a separate data collection for Perkins. You can reduce the burden for local leaders by aligning data collection timelines, cycles and definitions; using the same technology and systems to submit and warehouse data; and whenever possible tapping into data that are already available at the state level before going back to your local recipients.

Understanding how your data are collected and aligning processes and protocols across sectors can help improve the quality of data at the input stage. The downstream effect is that you and your stakeholders can trust your data more and you can spend less time questioning, auditing and cleaning your data after they have been submitted.



**State Examples**

The [**Kentucky** Center for Statistics](https://kystats.ky.gov/) (KYStats) is an independent agency with authority over all education, workforce and labor data across the state. The agency was established in 2012 after decades of work establishing data sharing agreements, gaining buy-in from agency heads, and getting legal approval to obtain and use data. KYStats matches learner-level data across sectors, allowing state leaders to reliably access information about outcomes for CTE completers from across the education system.

***Key Questions***

Answer the questions below in the space provided. While these questions are all optional, we encourage you to capture your thoughts here so that you can easily refer back to them.

***Adopting Rigorous Data Collection Methods***

|  |  |
| --- | --- |
| ***Key Questions*** | ***State Response*** |
| How are data being collected at the local level? Are the same methods used consistently across the state? |  |
| Are other agencies in your state collecting data that you might need or benefit from? |  |
| How many of your data elements are self-reported? Can you independently verify the data with external databases? |  |

## Creating Procedures for Analyzing Data

It Doesn’t Come Easy

*Recognize that data analysts, pressured for time, facing multiple requests, and often lacking background in CTE, will require your patience and support if they are to produce accurate data.*

Running data inquiries can be a complicated process, made all the more challenging if the individual tasked with performing the analysis is not familiar with CTE jargon or convention. To reduce error, states develop business rules to describe the procedures used to produce outcome data. This effort includes identifying the data elements that should be sourced to populate analysis databases, the programming codes used to formulate inquiries, and the years of data to respond to a given indicator.

Well-annotated rules combined with a well-documented data dictionary can help ensure that CTE data are reliable across years, irrespective of who runs the data. These rules also need to be developed for reporting purposes that may transcend CTE. For example, states reporting on students’ career readiness under ESSA will need to have business rules that ensure that the correct data are used to report on student performances.

There are multiple reasons to review your business rules to ensure that they are clearly articulated, easily understandable and readily accessible. If the analyst charged with running data is not housed in your unit, there is a good chance that he or she lacks awareness of CTE programming, which may lead to incorrect assumptions being applied. Given the infrequent nature of reporting — analyses typically are conducted only once a year — even seasoned staff may forget how they constructed measures year over year. Staff turnover is an ongoing challenge in many states, and newly hired individuals often are destined to fail.



**State Example**

**Florida** maintains a set of business rules for [secondary](http://www.fldoe.org/core/fileparse.php/7521/urlt/secondarymeasurebusrules.pdf) and [postsecondary CTE](http://www.fldoe.org/core/fileparse.php/7521/urlt/clockhrmeasurebusrules.pdf) that describe the operational definitions and procedures that state analysts use to analyze the Perkins core indicators. The instructions include detailed flow charts that describe the steps used to identify CTE concentrators; the data elements used to calculate measures; and how to construct the measure, including numerators and denominators.

***Key Questions***

Answer the questions below in the space provided. While these questions are all optional, we encourage you to capture your thoughts here so that you can easily refer back to them.

***Creating Procedures for Analyzing Data***

|  |  |
| --- | --- |
| ***Key Questions*** | ***State Response*** |
| Who runs the data for your state agency (i.e., your staff or a unit within the state)? How familiar are they with CTE programming and policies? |  |
| If your current CTE data analyst were to leave, how would his or her replacement know how to conduct required statistical analyses? |  |
| How comprehensible is the technical documentation used to analyze CTE data? What process is followed to ensure that business rules are accurate and up to date with federal/state policies? |  |

## Training Local Recipients on CTE Reporting

Think Human Interest

*If you do not take the time to write clear guidance that is informative and interesting, odds are, your audience will not take the time to read and interpret it.*

The quality of CTE data depends upon the understanding of individuals entering information into district or college databases and/or extracting it for state reporting. In some districts or colleges, the data entry staff member assigned to populate databases or respond to requests may be an entry-level clerical worker with little or no understanding of CTE.

Although states often spend considerable time and resources on training educators to improve CTE instruction, similar investments are not always made for district and college staff who have administrative responsibilities. For this reason, you may wish to review the reporting instructions and training materials to confirm their availability to local staff. Beyond confirming their existence, you may also wish to assess their readability.

One approach State Directors commonly use is to host and record statewide webinars to share CTE data reporting tips. Others have developed robust websites containing an array of materials to address specific reporting issues. While these approaches are excellent ways to support local analysts, creating a clearinghouse of information may not be enough. Consider interviewing a representative sample of data analysts within sites — secondary and postsecondary — to understand the challenges they face in collecting and reporting data and their preferred modes of communication. Use the feedback you receive to target resources to the identified needs or make improvements to your procedures and systems.

Moreover, not everything developed is worth maintaining. Periodically review your website postings, ideally before you anticipate traffic to the site, to cull outdated materials. In some instances, less is more. Reviewing statistics on website usage can help you determine the types of resources that are most popular and your investment of time.



**State Examples**

**Ohio** has recorded a 17-minute [YouTube video](https://www.youtube.com/watch?v=NDlWq0FJFW0&index=5&t=0s&list=PLDB1C5-YO_jjWvDESCZ048f3OjIBy9xel) to support districts in reporting CTE data using the state’s Education Management Information System. Reporting guidance, presented in webinar format, touches on key issues related to data entry, procedures for identifying student populations, data collection and reporting strategies, and approaches for resolving common reporting problems. The video presentation supplements a wealth of resources maintained on the state’s [Career Technical Education Data and Accountability](http://education.ohio.gov/Topics/Career-Tech/CTE-Performance-Data-and-Accountability) website.

**Oklahoma** also provides a [series of training videos](https://www.okcareertech.org/about/state-agency/divisions/federal-legislation-assistance/carl-perkins/ctims-resources/career-tech-information-management-system-ctims-resources) to help local providers use its data system.

**Nebraska** offers a [data reporting website](https://www.education.ne.gov/nce/cte-data-research/career-education-data-reporting/) for both secondary and postsecondary CTE as well as frequently asked questions to help providers when submitting their data.

**West Virginia** posts a [comprehensive calendar](http://wvde.state.wv.us/forms/calendar/wveis-collections/) for all data collections on its website, including for CTE-related reporting.

***Key Questions***

Answer the questions below in the space provided. While these questions are all optional, we encourage you to capture your thoughts here so that you can easily refer back to them.

***Training Local Recipients on CTE Reporting***

|  |  |
| --- | --- |
| ***Key Questions*** | ***State Response*** |
| What format(s) are used to provide annual training to local recipients at the secondary and postsecondary levels? |  |
| Where can local providers access written reporting instructions and guidance? |  |
| When was the last time you reviewed your state’s data collection guidance and supports to ensure that materials are up to date with current reporting requirements? |  |
| Is the length of the materials and manner in which they are offered appropriate for the content being offered? Put another way, if you were to take the training, would you find it useful and engaging? |  |
| To what extent are training resources tailored to secondary and postsecondary agencies? Will a singular approach prove useful? |  |

## Quality Assurance

When the CTE data submission window closes, with few exceptions, you will have a database containing outcome data from all CTE providers in the state. Simply because data have been submitted does not mean that they are correct. To save yourself future grief, taking some simple steps prior to running performance data is a good idea.

* *Build error-checks into submission templates —* Minor errors can easily find their way into reporting documents. To catch issues early, build checks into data submission templates that, for example, indicate if sub-populations of students sum to more than the total population of students or if the numerator for a measure is larger than its associated denominator.
* *Share prior-year data submissions —* Due to the time that elapses between annual reports, most data administrators lack a context for their information. Give local providers the raw data for prior-year reports so that site administrators have a yardstick against which to compare their current numbers.
* *Feed calculated results back to site CTE administrators —* Raw numbers can often be difficult to interpret. Once you have calculated local performance, arrange to have sites review the data to see if they raise red flags. Often, administrators will find submission errors due to misunderstandings or entry errors that only they are positioned to catch.
* *Convince yourself —* Odds are that you know a fair amount about how local sites are performing. Eyeball results to see if provider reports match your beliefs. Look for outliers or sites departing from past trends. And conduct your own gut checks, such as seeing if the number of prior-year graduates equates to the number included in subsequent year follow-up.
* *Trust but verify —* Whenever possible, try to cross-reference your data with other data sources to see if there are any discrepancies. For example, if you are collecting data for recognized postsecondary credential attainment, try to verify your numbers directly with the credential provider to see if they are accurate. This work is tough but has immense payoffs by giving you full confidence in your data.

A helpful resource – *Defining High-Quality CTE: Quality CTE Program of Study Framework, v. 4.0 –* is a [framework](https://www.acteonline.org/wp-content/uploads/2018/02/ACTE-HighQualityCTEFramework-Draft4.0-Beta.pdf) developed by the Association for Career and Technical Education that contains elements and criteria that states may use to promote local development of functional CTE programs of study. Among the 12 elements identified is a section on Data and Program Improvement, which offers nine criteria that states may use to promote the collection of accurate data.



**State Examples**

The **Pennsylvania** Department of Education has created a [Data Quality Curriculum](http://www.education.pa.gov/Documents/Teachers-Administrators/PIMS/PIMS%20Postsecondary/PIMS%20PS%20Perkins%202016-2017%20Data%20Submission/2016-17%20PIMS%20Perkins%20Postsecondary%20Manual%20-%20Volume%201.pdfhttps:/www.ciu10.org/cms/lib/PA06001249/Centricity/Domain/131/CTE%20Module%20Syllabus.pdf) to provide detailed, data-related information to CTE provider staff responsible for collecting, entering and uploading data into the state’s education longitudinal data system. The training module is delivered online, using the platform of Moodle. Coursework includes an online exercise, resource review and optional forum discussion.

In **Virginia**, the Department of Education uses reports from credential providers to verify and audit credential attainment data. The department conducts an electronic and manual analysis to identify discrepancies, such as irregular variances in the number of learners earning industry-recognized credentials, and will request additional information from the local institution if necessary.

***Key Questions***

Answer the questions below in the space provided. While these questions are all optional, we encourage you to capture your thoughts here so that you can easily refer back to them.

***Quality Assurance***

|  |  |
| --- | --- |
| ***Key Questions*** | ***State Response*** |
| What types of internal quality checks or error identifications are programmed into your systems? |  |
| Which measures are local programs most likely to have errors in reporting? |  |
| How is local program staff provided opportunities to review data before formal submission? |  |
| What steps are taken to validate the accuracy and reliability of your data? |  |

# Final Reflections & Next Steps

## Post-Module Survey

Please take this brief [post-module assessment](https://www.surveymonkey.com/r/2018-19-new-sd-test) to let us know what you learned and how we can help.

## Next Steps

The information contained in this module is intended to help you create and institutionalize procedures to improve the accuracy of the CTE data you collect and report on an annual basis. These data include accountability data you are required to collect for federal and state compliance purposes, as well as information you need to investigate your own research questions.

Your goal, as State Director, is to move toward data-driven decision-making. In doing so, your emphasis should be on moving from compliance reporting to program improvement. The tools provided are the building blocks for creating a comprehensive and consistent state educational administrative record system to organize your CTE data. Keep in mind that these tools are a necessary, but not sufficient, condition for ensuring high-quality reporting.

Ultimately, data are useful only if they can be applied. While this module offers guidance that will help to ensure that you are collecting and maintaining accurate, high-quality data, what you do with the information will determine its value. We encourage you to use the resources maintained within the [Learning that Works Resource Center](https://careertech.org/resources) and to contact the staff at Advance CTE for support in using data to improve outcomes for all learners.

# Appendix A: Planning Chart

**Data & Accountability**

**High-level Goals and Action Steps**

|  |  |  |
| --- | --- | --- |
| **Immediate (Next 0-3 Months)** | | |
| **Main Goals/Priorities** | **Action Steps**  **(Planned)** | **Potential Concerns**  (Related to goals or actions) |
| 1. | **•** | **•** |
| 2. | **•** | **•** |
| 3. | **•** | **•** |
| **Intermediate (Next 4-9 Months)** | | |
| **Main Goals/Priorities** | **Action Steps**  (Planned) | **Potential Concerns**  (Related to goals or actions) |
| 1. | • | • |
| 2. | • | • |
| 3. | • | • |
| **Longterm (Next 10-18 Months)** | | |
| **Main Goals/Priorities** | **Action Steps**  (Planned) | **Potential Concerns**  (Related to goals or actions) |
| 1. | • | • |
| 2. | • | • |
| 3. | • | • |

# Appendix B: Annual Data Requests Checklist

**Report Name:**

|  |
| --- |
| *Purpose of Request* |
| *Source of Request* |
| *Research Questions* |
| *Timing of Request* |
| *Priority* (ranking 1 = lowest priority, 5 = highest priority) |
| *Responsibility* |