ADVANCE>CTE
State Leaders Connecting Learning to Work

New State CTE Director
Leadership Program

Module 4:
Establishing High-Quality CTE Data Systems to Inform Decision Making

Summer 2018

Contents

How to Use the Modules

The New State Director Leadership Program is designed to fit the natural learning curve of new State CTE Directors as they explore their state CTE system 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, two webinars and intermittent optional phone calls to provide comprehensive supports to these new leaders. The program, with its curriculum, touchpoints and mentorship, is designed to allow new State Directors to access the support they need, when they need it.

This module is part of the 12-month curriculum that is designed to help you be inquisitive about your state's current "state of play," 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 you are 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 with any relevant state and federal guidance and regulatory requirements to ensure compliance. Further, the examples listed within are not endorsements nor should be considered a comprehensive list.

Module Objectives & Pre-Module Survey

Module Objectives

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.
- 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, and choose the "Data" option:
https://www.surveymonkey.com/r/NewSDpre-test

Getting Started

Why Assess?

Your position as State CTE Director offers you access to a storehouse of program- and student-level data that spans the secondary and postsecondary education levels, 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 shouldn't 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, it is critical that the decisions you make and information you share are based on accurate data.

Although program guidance and financial support for CTE comes 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) have shaped the measures used to quantify state and local performance and dictated the characteristics of students who are assessed. If 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 that CTE offers. We seek to offer a balanced approach to using data to meet federal collection requirements and drive program improvement. Where possible, we also emphasize data collection strategies you can use for both federal and state purposes.

> **PROACTIVE THINKING—**
>
> *Using data effectively entails shifting from a compliance to improvement mindset—to using data not to avoid consequences, but to drive program growth and success.*

Data & Accountability Refresher

Much of the CTE data contained within states' administrative record systems is closely aligned with federal regulations. 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'll 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 completing a threshold level of coursework within a state-recognized CTE program in order to be included in the measurement population.

The U.S. Department of Education's Office of Career, Technical, and Adult Education (OCTAE) has compiled resources you may wish to consult to learn more about the accountability provisions contained within Perkins, as well as issues associated with CTE data quality.

Federal Accountability

The Perkins Collaborative Resource Network (PCRN) is a website maintained by OCTAE that contains a wealth of information on CTE data and accountability, along with resources and technical assistance tools to assist you in improving the quality of the CTE data you collect. We suggest you begin by looking at the following resources.

(1) Non-regulatory guidance—In March 2007, OCTAE released non-binding guidance to assist states in designing their CTE accountability systems. The document offers detailed information on the (a) threshold course-taking levels used to identify the secondary and postsecondary student populations included in the federal indicators, and (b) measure constructions, including the numerator and denominator used to quantify performance.

(2) Consolidated Annual Report (CAR) training materials—Data on state CTE performances must be submitted to OCTAE on an annual basis. As State Director, you are responsible for submitting and certifying the accuracy of your state data. Visit the PCRN to familiarize yourself with the submission requirements and access training materials to assist you in preparing your data. Understanding the data you will need to submit for each measure and subpopulation of students will help you in evaluating the completeness of your own state system.

(3) State Profiles—Information on your state's financing, enrollment, and performance on the Perkins indicators is posted on the PCRN. We suggest reviewing your state data to ensure its accuracy and familiarize yourself with what is available for public viewing. You may also download your own and other states' plans for CTE. Additionally, visit the Perkins Data Explorer to create and download customized state reports on CTE student enrollment and performance.

(4) Technical Assistance to States—OCTAE offers individualized technical assistance to states on an annual basis. This support is specifically directed towards helping states improve the quality of their CTE data and accountability systems, with an emphasis on the Perkins IV indicators. Use the search features on the page to identify topics on which other states have received support.

States also are increasingly including career-focused indicators in other accountability systems. CTE is unique in that it has connections to many federal education and training laws.

(1) Every Student Succeeds Act (ESSA)—Signed into law in 2015, ESSA provides funding and guidance to ensure that all students are held to high academic standards. The law calls for coordination of ESSA and CTE state plans, and encourages states to assess the progress of students in attaining CTE proficiencies on state report cards and to integrate career readiness measures into their state accountability systems. See the PCRN ESSA webpage, the Advance CTE's report on ESSA indicators, as well as your own state plan for more information.

(2) Workforce Innovation Opportunity Act (WIOA)—Authorized in 2014, WIOA supports workforce development and job training programs for displaced adult and youth workers. The law calls for increased coordination between states' workforce development and CTE systems, the inclusion of postsecondary CTE providers as a local infrastructure partner, and the option for states to create a combined state plan that addresses WIOA's core programs and Perkins. Information can be found on the PCRN State Plan Guidance webpage, the Advance CTE website, and your own state plan for WIOA.

Section 1: Determining Your State's Data Needs

Now that you have gathered some background information on data and accountability, it's time to jump into ways in which you can strengthen your own policies, programs and processes. 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 they are accurate and of high quality
- Analyze data to produce comparable results year-over-year

We also will point you in the direction of states 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 states' 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.

To ensure that you have the data needed to respond to routine information requests, it can be helpful to document the statistics you will need to produce on a regular basis and when these asks will occur. Since it will be difficult in a single sitting to array all of the "research questions" you and your staff will be asked to answer, you can use the tools below to begin categorizing these requests. This 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 catalogue of the data requests made of your team. In doing so, you will be creating a written institutional memory of your state's CTE data needs. This information can be invaluable in ensuring you anticipate and meet your various reporting deadlines. It can also assist in staff planning, for example in distributing workloads or scheduling vacations. Perhaps most importantly, it establishes a physical record that can help new staff, or your successor, quickly come up to speed on their obligations.

It is important to recognize that the information you collect 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) to catalog the requests you and your staff need to address on an annual basis, with one page for each request. Be prepared to provide details on the:

- *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.

- *Timing of request*—When is the request typically received and when is a response required? If 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(s) used for high-stakes reporting, such as responding to federal Perkins IV accountability reporting? This can help you to determine the amount of attention and review that you invest in its production.

- *Responsibility*—Who on staff are tasked with answering the identified questions? Are they aware of their ownership of the data?

Key Questions: Managing CTE Data Requests

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.

	Key Questions	State Response
Managing CTE Data Requests	What are the top five questions you believe need to be answered to improve the quality of CTE offered in your state?	
	What are the three most common questions you are asked about CTE annually?	
	Where do new CTE data analysts go to find information on the types of reports that they will need to create on an annual basis?	
	Who are your key stakeholders who come to you on an annual basis with requests for CTE 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 people want or need to know, you can use data to formulate responses as well as create 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 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's 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. This means you can't simply hand off responsibility to your staff—you have ultimate ownership of the data that will be used to answer the research questions posed.

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 the measures are based on quality and accurate data.

Ensuring that you have a full understanding of the question may require that you consult with the agency or individual making the request to ensure that you fully understand their 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.

LOGIC DICTATES—
If you don't understand the thinking behind the request, odds are, you won't produce an accurate response.

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 would repeat this activity for each of the research questions you identified in the activity above.

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 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 is the four-year graduation rate of 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
- *Graduation*—indication of whether student did or did not graduate from school

Answering this question fully will require considering a range of additional factors. Since the CTE concentrator population is not a single construct, you may need to either narrow the question to address a specific subpopulation—such as learners who are female and identify as Hispanic—or

identify the differing types of learners you would want to include in your analysis. Possible options could include:

- Gender
- Race and/or ethnicity
- Urbanicity
- Nontraditional status
- Special population status
- 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, since collection may occur at differing 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, it is essential that you understand the nuances of your data, as well as any changes over time that may complicate using it to tell a story.*

State Examples

- The Pennsylvania Department of Education maintains a comprehensive website containing information on its statewide longitudinal data system. 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, which includes a listing of all of the data collected for CTE reporting and the business rules associated with their use.

Key Questions: Selecting the Variables

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

	Key Questions	*State Response*
Selecting the Variables	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 on CTE programming offered in your state?	

Step 2: Sourcing the Data

Once you've selected your variables, the data you need may reside in a variety of locations. Data on student course taking, academic performance, attendance, and other educational experiences typically will be housed in your state's educational administrative record system. In some instances, your state agency may maintain a separate database containing CTE variables. 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 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.

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 could entail tracking transitions into postsecondary education and/or employment, and for college students, transitions from a two-year to four-year college or university and/or employment.

Traditionally, state data linkages have been directed toward collecting information required for Perkins reporting. Consider other data sources that may help to tell a more nuanced story on CTE program completers. Databases may include:

In-state

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

External

- *National Student Clearinghouse*—enrollment in colleges or universities throughout the country
- *Wage Record Interchange System*—employment outcomes and earnings in participating states
- *Industry certification providers*—professional associations offering industry-recognized credentials or certificates

- *Department of Defense*—military enlistments
- *Office of Personnel Management*—federal employment

Memoranda of Understanding (MOU) 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 that illustrates, in graphical form, the data reporting systems that are feed into the system's data warehouse. The workflow 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.

- The Washington State Workforce Training and Education Coordinating Board maintains documentation of the workforce-related databases and tables stored on the agency's server related to the employment and further education of program participants. The document 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.

Key Questions: Sourcing the Data

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

	Key Questions	State Response
Sourcing the Data	Which of the in-state data sources are you currently accessing to support your CTE reporting?	
	Which of the 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 externals 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 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.

State Examples

- Colorado is preparing to produce an annual CTE Fact Sheet that offers student participation and outcome data for secondary and postsecondary programming. To help school districts and colleges interpret the statistics included, the state has developed a document that defines key terms and explains how the measures are constructed. Educators may use the tool to help fact their own fact sheets for their CTE programs. As of June 2018, the documentation was in its final stages. Contact Sarah Heath at sarah.heath@cccs.edu for more information.

Helpful Resource:

Career Readiness & the Every Student Succeeds Act: Mapping Career Readiness in ESSA State Plans

ESSA offers states an opportunity to design their K–12 education systems to prepare students for college and careers. States are taking advantage of flexibility contained within the act to incorporate indicators of career readiness in their state plan. Advance CTE has produced a report summarizing states' approaches to assessing career readiness that includes examples of state measurement approaches. See the report appendix for a state-by-state listing of accountability measures.

To receive additional assistance on this topic, contact Kate Kreamer at kkreamer@careertech.org. Advance CTE is happy to provide virtual and in-person technical assistance.

Key Questions: Constructing the Measure

Ideally, you will use the checklist to identify the data elements and considerations you will need to consider in answering each research question. In applying the checklist, some questions include:

	Key Questions	State Response
Constructing the Metric	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 percent of students have you been able to track using the identifier)?	
	Does your state have MOU 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
- Nontraditional status
- Special population status
- 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., who 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 Metrics

☐ 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.

Ultimately, the outcomes you report on CTE programming are dependent 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 data and accountability system functions, and a well-documented process for safeguarding data quality. The following section identifies key components of a well-designed accountability system to help you understand what you need to know about your system structure, using state examples to illustrate concepts.

> **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.*

Defining Data Elements

A data dictionary arrays the variables that comprise 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 1-3 word) description of the variable
- *Element definition*—a brief (typically 1-2 sentence) explanation of the element and its purpose
- *Variable codes*—listing 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
- *Notes*—special instructions or background information

With the advent of statewide longitudinal data systems (SLDS), 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.

It is equally critical that local staff charged with entering data into their administrative record systems (used to populate 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.

Don't 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 that provides for the collection of CTE data from the state's 67 school districts and 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 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 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.

Key Questions: Defining Data Elements

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

	Key Questions	State Response
Defining Data Elements	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 has responsibility for this process?	
	Do local providers have access 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 states?	

Creating Procedures for Analyzing 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 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 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 change 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.

> **IT DON'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.*

State Examples

- Florida maintains a set of business rules for secondary and postsecondary CTE 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 measure construction, including numerators and denominators.

Key Questions: Creating Procedures for Analyzing Data

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

	Key Questions	State Response
Creating Procedures for Analyzing Data	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/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 update business rules to ensure that they are accurate and up-to-date with federal/state policies?	

Training Local Providers on CTE Reporting

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 many districts or colleges, the

data entry staff member assigned to populate databases or respond to requests is often an entry-level clerical worker who may have little or no understanding of CTE.

Although states often spend considerable time and resources in 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 and entertainment value.

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 for supporting 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 whether the investment of time you make in creating and posting documents is worth the time you spent creating them.

> **THINK HUMAN INTEREST—**
>
> *If you don't take the time to write clear guidance that is informative and interesting, odds are, your audience won't take the time to read and interpret it*

State Examples

- Ohio has recorded a 17-minute YouTube video to support districts in reporting CTE data using the state's Education Management Information System (EMIS). 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 website.

- Oklahoma also provides a series of training videos to help local providers use its data system.

- Nebraska offers a data reporting website 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 for all data collections on its website, including for CTE-related reporting.

Key Questions: Training Local Providers on CTE Reporting

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

	Key Questions	State Response
	What format(s) are used to provide annual training to local providers at the secondary and postsecondary levels?	

Training Local Providers on CTE Reporting	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 has been submitted doesn't mean that it is correct. To save yourself future grief, it's a good idea to take some simple steps prior to running performance data.

- *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, for example that indicate if subpopulations 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 to give site administrators 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've calculated local performance, arrange to have sites review the data to see if it raises red flags. Often, administrators will find submission errors due to misunderstandings or entry error that only they are positioned to catch.

- *Convince yourself*—Odds are that you know a fair amount of 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 laugh tests; such as seeing if the number of prior year graduates equates to the number included in subsequent year follow-up.

Helpful Resource: *Defining High-Quality CTE: Quality CTE Program of Study Framework, v. 4.0*

The Association for Career and Technical Education has developed a framework containing 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 9 criteria that states may use to promote the collection of accurate data.

To receive additional assistance on how to use the framework, contact Catherine Imperatore at cimperatore@acteonline.org.

State Examples

- The Pennsylvania Department of Education has created a Data Quality Curriculum 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.

Key Questions: Quality Assurance

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

	Key Questions	**State Response**
Quality Assurance	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?	

Final Reflections & Next Steps

Post-Module Survey

Please take this brief post-module assessment to let us know what you learned and how we can help: https://www.surveymonkey.com/r/NewSDpost-test

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. This includes accountability data you are required to collect for federal and state compliance purposes, as well as information that 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 only useful if they can be applied. While this module offers guidance that will help to ensure 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 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 and/or action steps)
1.	●	●
2.	●	●
3.	●	●
Intermediate (Next 4-9 Months)		
Main Goals/Priorities	Action Steps (Planned)	Potential Concerns (Related to goals and/or action steps)
1.	●	●
2.	●	●
3.	●	●
Long-term (Next 10-18 Months)		
Main Goals/Priorities	Action Steps (Planned)	Potential Concerns (Related to goals and/or action steps)

1.	•	•
2.	•	•
3.	•	•

Appendix B: Annual Data Requests

REPORT NAME: _____

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

Appendix C: Research Questions Checklist

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
- Nontraditional status
- Special population status
- 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., who 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 Metrics

☐   Numerator: the number of individuals who have met the criteria of study

☐   Denominator: the number of individuals eligible for inclusion in the indicator