Understanding Career and Technical Education Data and Why It Matters
Training Module Series #1
Mission

To expand the evidence base on the impact of career and technical education (CTE) programs on student outcomes, by

- Increasing the number of CTE impact studies performed.
- Strengthening field capacity to conduct and use rigorous CTE research.

The work of the Network member projects is supported by the Institute. The opinions expressed are those of the authors and do not represent the views of the Institute or the U.S. Department of Education.
Practitioner Training Modules
This series of six modules is designed to support CTE educators in learning more about data and research.

1. Understanding CTE data and why it matters
2. Using data and research to improve CTE programs
3. CTE program evaluation: Why it matters to practitioners
4. Using state data to partner with researchers
5. Using research to design your CTE program for equity
6. How to communicate about your CTE program using research

Module Contents

- Defining Key Terminology
- Understanding CTE Data
  - What Are CTE Data?
  - Where Do CTE Data Come From?
  - How Are CTE Data Collected?
  - **Activity: Identifying what exists**
  - Why Do CTE Data Matter?
- Understanding CTE Research
  - What Are the Types of Research?
  - How Do Data Support Research?
  - What Are the Levels of Evidence in Research?
  - Finding Evidence-Based Resources

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After viewing this module, you should be able to:

- Answer fundamental questions about data and research for CTE programs.
- Connect data to *Perkins V* requirements.
- Define evidence-based research, understand why it is important, and where to find it.
- Understand real-world examples of CTE data and research.
Module Instructions

This module includes processes, activities, and tools you can use to drive change at your site.

Before you begin, we recommend downloading and printing the activity worksheets to help contextualize your viewing.
Activity 1: Opening Self-Reflection

Think about how you might use high-quality CTE data and research to change people’s perceptions about CTE programming at your site.

- Answer the questions included in the Self-Reflection Activity worksheet provided.
- Restart the module when you have completed the worksheet.

Defining Key Terminology
Components of CTE Instruction

- Technical Skills
- Academic Knowledge
- Employability Skills

Postsecondary and Career Readiness
Types of Research

- **Quantitative Research**
  Findings expressed using numerical terminology

- **Qualitative Research**
  Findings expressed using descriptive terminology
Categories of Research

- **Descriptive Research**
  Results are used to describe current conditions, but are not intended for predictive purposes

- **Correlational Research**
  Results express numeric relationships and support prediction, but cannot be used to establish cause-and-effect

- **Causal Research**
  Results expressed in numeric terms and support prediction; can be used to establish cause-and-effect
Understanding CTE Data
What Are CTE Data?

CTE data are statistics or facts used to describe program operations and the outcomes students achieve.

Descriptive Data: Levels

- Program level
  - Number and type of programs offered
  - Expenditures for equipment and supplies
  - Percentage of pathways offering dual credit or industry credentials

- Student level
  - Number of participants, concentrators, and completers
  - Demographic characteristics
  - Outcomes achieved
Descriptive Data: Timing

- Assess existing conditions
  - Status of current programming
  - Outcomes of on-site learners
  - In comparison to the past

- Document post-program results
  - Describe future state
  - Assess off-site outcomes
Where Do CTE Data Come From?

- **Federal**
  - Comprehensive local needs assessment
  - *Perkins V* accountability indicators

- **State**
  - Administrative reporting
  - Financial monitoring

- **Local**
  - Site-specific metrics

How Are CTE Data Collected?

- Data sets
  - Original data
  - Analysis of existing databases
- Observational studies
  - Focus group interviews
  - Case study visits
- Surveys
  - Online or hardcopy
Think about the types of data your program could have, or is already collecting, to assess CTE program operations and outcomes.

- Write down a list of the types of data that might exist at your site and who you might consult to learn more about the data.
- Restart the module when you have completed the worksheet.
Why Do CTE Data Matter?

- Compliance reporting
  - Document appropriate use
  - Ensure financial accountability
- Assess performance
  - Program process and outcomes
  - Student progress and outcomes
- Guide improvement
  - Identify areas of need

Using Data: Michigan Department of Education

- Assess median annual wages of high school graduates by:
  - Intensity of CTE participation
  - Credential or degree type

- Indicate that wages increase for students who:
  - Complete more CTE coursework.
  - Earn more advanced credentials or degrees.

Using Data: Sausalito Unified School District

CTE Student Certifications and Internships - (2019 - 2020)

- Tracks student certifications and internships annually
  - Publicizes results on webpage
  - Includes data for 15 certification types

<table>
<thead>
<tr>
<th>Certification</th>
<th>Passed</th>
<th>Certification</th>
<th>Passed</th>
</tr>
</thead>
<tbody>
<tr>
<td>CALIFORNIA RESTAURANT ASSOCIATION</td>
<td>61</td>
<td>CPR &amp; First Aid</td>
<td>229</td>
</tr>
<tr>
<td>(A6 Electrical)</td>
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<tr>
<td>Microsoft Office Specialist</td>
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<td>ASSET: Medical Assistant</td>
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<tr>
<td>ServSafe</td>
<td>182</td>
<td>Adobe CERTIFIED</td>
<td>N/A</td>
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</tbody>
</table>

2019–20 Industry Certifications: 1,462
2019–20 Internships: 641

https://www.sausd.us/cte
Using Data: The College System of Tennessee

- Data dashboards provide visual and interactive data on student
  - enrollment, by program and demographics;
  - success, including job placement and licensure rates; and
  - awards, by program and demographics.

- Users may select systemwide or college-level data; see https://www.tbr.edu/policy-strategy/data-and-research.
Understanding CTE Research
What Are the Types of Research?

- **Qualitative**
  - Offered as a description
  - Described in terms of characteristics or observable phenomenon that cannot be expressed in numbers

- **Quantitative**
  - Expressed in numeric terms
  - Offers information on the quantity or amount of CTE programming
Research Methods: Descriptive

- Used to accurately and systematically describe a population or site conditions
- Often based on observations, which may be collected using case study visits, focus group interviews, or surveys
- Not intended for predictive purposes

Example: A researcher conducts focus group interviews with CTE teachers to assess why fewer females enroll in science, technology, engineering, and mathematics (STEM) programs than males.
Research Methods: Correlational

- Used to measure the relationship between two variables
- Relationships are rated as having a positive, negative, or zero correlation
- Intended to predict the future but not to establish a cause-and-effect relationship

**Example:** A researcher seeks to assess whether there is a relationship between the award of dual credit and college enrollment for CTE concentrators.
Research Methods: Causal

- Used to assess whether one variable causes an outcome to occur
- Entail the use of complicated research designs and statistical methods to isolate external influences
- Intended to establish a cause-and-effect relationship

Example: A researcher assesses graduation rates for students selected to enroll in a career academy using a lottery system to qualify for admission.

# Descriptive Research Methods: Comparison

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Descriptive</th>
<th>Correlational</th>
<th>Causal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose</strong></td>
<td>Describes status</td>
<td>Assesses relationships among variables</td>
<td>Assesses how change in one variable effects outcomes</td>
</tr>
<tr>
<td><strong>Pro</strong></td>
<td>Offers detailed view of system</td>
<td>Allows for predictions</td>
<td>Supports making cause-and-effect conclusions</td>
</tr>
<tr>
<td><strong>Con</strong></td>
<td>Cannot assess relationships nor impacts</td>
<td>Does not support cause-and-effect conclusions</td>
<td>Some limitations in how variables may be manipulated</td>
</tr>
</tbody>
</table>
A research question describes what a study is seeking to answer. A good research question:

- Clearly defines what is to be studied.
- Helps clarify the method to be used.
- Informs the type of data to be collected.

https://pixabay.com/photos/surprise-box-question-question-2703467/
What Are the Levels of Evidence in Research?

Criteria for Evaluating Program Interventions

- **Tier 1: Strong Evidence**
- **Tier 2: Moderate Evidence**
- **Tier 3: Promising Evidence**
- **Tier 4: Demonstrates a Rationale**
Finding Evidence-Based Resources

Educators may draw on a wealth of resources to find evidence-based programs, policies, and practices:

https://cteresearchnetwork.org/
https://ies.ed.gov/ncee/wwc/
https://pathwaystowork.acf.hhs.gov/
Applying evidence-based interventions can increase your chances of success. Advantages include:

- A proven and tested approach
- Outcomes are well defined
- The level of effectiveness can be quantified

https://pixabay.com/illustrations/checklist-clipboard-questionnaire-1622517/
Adopting Evidence-Based Interventions

Considerations in choosing interventions include:

- **Purpose**
  - Was the intervention focused on a similar problem?
  - Was the study rigor acceptable for your needs?

- **Context**
  - Was the study site like your own?
  - Were the student populations similar?

- **Results**
  - Were the outcomes reported aligned to your goals?
  - Will the level of effectiveness justify your investment?
Closing Reflection and Resources
Activity 3: Closing Self-Reflection

How might you apply the information contained within this module to improve your use of data and research?

- Answer the questions included in the Activity 3 worksheet provided.
- Restart the module when you have completed the worksheet.

References and Resources


Activity Handouts 1–3
Contact Information

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