Using Data and Research to Improve Career and Technical Education Programs

Training Module Series #2

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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.
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
- Using Data and Evidence-Based Research to Improve CTE Programs
  - Plan: Frame and research the problem.
  - Do: Implement a solution.
  - Study: Use data to assess results.
  - Act: Revise and start the cycle again.

- Activities 2-4: Launching a Continuous Improvement Process

https://pixabay.com/photos/checklist-list-ticked-off-hook-2945401/
Objectives

- Understand how data and research are used to improve CTE programs.
- Learn how to access and use research relevant to CTE programs.
- Learn about the continuous improvement model as it applies to CTE.
- Consider short-term versus long-term program planning.
- Understand real-world examples.

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 the module content.
Think about a pressing CTE problem you face 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
Continuous Improvement

A structured process for using data and research to improve educational programming
Continuous improvement has been used in many sectors to achieve significant advances.

Many models exist; what matters is that educators employ a systemic approach to structure their efforts.

Improvement models employ a cycle of research and planning that is both iterative and gradual.
A method of problem solving that tries to identify the underlying factors that contribute to problems or patterns found in data.
Using Data and Evidence-Based Research to Improve CTE Programs
Continuous Improvement Model: Plan
Plan: Build a Coalition

- Team members
  - Instructors (CTE and academic)
  - Site leaders
  - Students
  - Parents
  - Employers
  - Community-based organizations

https://images.unsplash.com/photo-1568992688527-e1c1894e4e30?ixlib=rb-1.2.1&ixid=eyJhcHBfaWQiOjEyMDd9&auto=format&fit=crop&w=634&q=80
Plan: Define the Problem

- What challenges do you face?
  - Collect data
    - Survey stakeholders
    - Conduct focus groups interviews
    - Review performance data
- Analyze results
  - What is their relative priority?
  - Which issues are actionable?
Biannual review of site programming mandated in *Perkins V*:

- Assess student performance.
- Review program offerings to:
  - Rate program size, scope, and quality.
  - Determine alignment to in-demand industry or job needs.
  - Assess design to meet local education or economic needs.

Data Sources

Comprehensive local needs assessment video (#7):
https://cte.ed.gov/legislation/perkins-v
Previous Research: Federal Resources

- Learning Center with videos and training modules
- Reports and programs
- Certifications
- Customized data reports

https://cte.ed.gov/resources/search-resources
Previous Research: CTE Network Resources

- Dedicated to strengthening the quality of CTE research
- Highlights high-quality evidence-based research
- Includes a searchable catalog of resources designed for use by practitioners

https://cteresearchnetwork.org/
Previous Research: Association Resources

- National association for state CTE directors and staff
- Features Learning that Works Resource Center
  - https://www.careertech.org/resource-center

- National association for CTE administrators and instructors
- Offers publications and lesson plan resources
  - https://www.actonline.org/publications/
Previous Research: Journal Resources

National journals:
- Offer access to peer-reviewed research.
- Document program offerings and outcomes.
- Are used to identify possible root causes and programmatic interventions to address.
Activity 2: Applying Research

- To find CTE research to address a pressing CTE challenge:
  - Frame the challenge.
  - Conduct a targeted search.
  - Review study abstracts for fit.
  - Consider how to apply the approach in your program.
Plan: Analyze Performance Gaps

- Federal *Perkins V* indicators

<table>
<thead>
<tr>
<th>Secondary</th>
<th>Postsecondary</th>
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<tbody>
<tr>
<td>Academic attainment</td>
<td>Postsecondary placement</td>
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<td>Graduation rates</td>
<td>Postsecondary credential</td>
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<td>Postsecondary placement</td>
<td>Nontraditional occupations</td>
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<td>Nontraditional occupations</td>
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<tr>
<td>Program quality</td>
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</table>

- State indicators
- Local performance
Plan: Analyze Performance Gaps

- Student subgroups
  - Gender
  - Race/ethnicity
  - Special population status

- Program cluster or pathway
  - Cluster and pathway

- Site characteristics
  - Urbanicity
  - School type (e.g., regular high school, academy)
Grounding Your Gap Analysis

Research is formalized curiosity. It is poking and prying with a purpose.

– Zora Neale-Hurston

Root Cause Analysis

- Problem statement
  - What is the issue you wish to solve?
- Factors
  - Components of the problem
  - Typically encompass broad areas (e.g., students, schools, processes)
- Issues
  - Explanations underlying a factor
  - Multiple issues may be identified

https://pixabay.com/vectors/question-questions-man-head-2519654/
Root Cause Analysis

Source: http://templatelab.com/fishbone-diagram-templates/

Students are not enrolling in work-based learning

Employers

Students

Systemic

Teachers

Unaware of benefits

Lack time to participate

Parental opposition

Problem:
Root Cause Analysis

Employers
- Unsure how to engage
- Cost
  - Scheduling
    - Insurance concerns
  - Transport
- Liability

Students
- Unaware of benefits
  - Parental opposition
  - Unaware of benefits
- Lack time to participate
  - Curricular needs
  - Lack of contacts

Systemic

Teachers

Problem:
Difficulty placing students in a work-based learning opportunity

Source: http://templatelab.com/fishbone-diagram-templates/
Activity 3: Root Cause Analysis

- Review performance data.
  - Answer the question.
- Define your problem statement.
  - What do you plan to address?
- Perform root cause analysis.
  - Identify possible factors.

Continuous Improvement
Model: Do
Do: Identify Promising Practices

- **What do we know?**
  - Review empirical research literature.

- **Who is succeeding?**
  - Use data to identify high-performing sites.

- **What resources exist?**
  - Federal government
  - State agency
  - Professional associations
  - Research community
**Do: Create an Operational Plan**

### Career and Technical Education Improvement

**GOAL:** Increase student enrollment in work-based learning opportunities

**EVIDENCE BASE:** Examined the WBL toolkit on the federal Peer Collaborative Resource Network [https://cte.ed.gov/toolkit/engaging.html](https://cte.ed.gov/toolkit/engaging.html); tools for building employer-education partnerships on the LINCS website [https://lincs.ed.gov/employers/about.htm](https://lincs.ed.gov/employers/about.htm); and the Work-Based Learning Toolbox developed by the College & Career Academy Support Network [https://casn.berkeley.edu/toolbox-work-based-learning/](https://casn.berkeley.edu/toolbox-work-based-learning/)

### BENCHMARKS

1. **Expand Placement**  
   • Double the number of employers participating in WBL programs by end of first year

### STRATEGIES FOR SUCCESS

<table>
<thead>
<tr>
<th>STRATEGIES FOR SUCCESS</th>
<th>ACTIVITIES</th>
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</thead>
</table>
| **1. Expand Placement Options**  
  *Increase the number of employers providing work-based learning experiences* | A. Develop promotional materials to advertise the benefits of work-based learning to students and employers  
B. Create curricular supports to assist employers in structuring a meaningful work-based learning experience  
C. Research approaches for addressing employers’ liability concerns |
### Strategy 1: Expand Placement Options

**Activity 1.A:** Develop promotional tools to advertise the benefits of work-based learning to students and employers.

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Who</th>
<th>When</th>
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<tbody>
<tr>
<td>Develop a student-focused brochure</td>
<td>Sally M.</td>
<td>Oct. 16, 2020</td>
</tr>
<tr>
<td>Develop employer handouts</td>
<td>Tim S.</td>
<td>Nov. 13, 2020</td>
</tr>
<tr>
<td>Create an article for the community paper</td>
<td>Mark R.</td>
<td>Dec. 4, 2020</td>
</tr>
</tbody>
</table>
Activity 4: Operational Planning

- Operationalize the challenge.
  - Identify a set of strategies.
  - Define activities to address.
  - Specify a measurable benchmark.

Continuous Improvement Model: Study
Study: Collect Performance Data

- Identify indicators to assess outcomes.
  - Specify a set of measurable outcomes.
  - Define numerators and denominators.
- Collect and analyze data.
  - Establish collection procedures.
  - Set a timeline for collection.

https://pixabay.com/photos/measurement-krawiecka-meter-3176118/
Study: Long- Versus Short-Term Outcomes

- **Process indicators**
  - Track implementation activities.
  - Provide formative feedback.

- **Interim outcomes**
  - Assess early successes.
  - May be related to your longer term goal.

- **Middle- and long-term outcomes**
  - Used to assess your overall goal.
  - Often may take years to achieve.
Study: Engage Stakeholders

- Build buy-in among CTE stakeholders.
  - Involve stakeholders in studying data.
  - Convene educators to fine-tune activities.
- Share findings on a regular basis.
  - Translate complex data into usable information.
  - Create dashboards to publicize results.
- Click here to see an example of how data have been used to drive change:
Activity 5: Study the Data

CTE Dual Enrollment Program in State A: Student Makeup, by FRL Status

- FRL Eligible Students, 26%
- Non-FRL Eligible Students, 74%

Percent of CTE Dual Enrollment Programs in Schools in State A, by FRL levels:

- <50% FRL students: 63%
- 50-75% FRL students: 26%
- >75% FRL students: 11%
Continuous Improvement Model: Act
Continuous Improvement

A structured process for using data and research to improve educational programming

- **PLAN**: Determine what you will do and what should result
- **DO**: Design and implement your plan
- **ACT**: Use results to strengthen activities
- **STUDY**: Compare actual with expected result
Review the strategies you selected to address your identified problem.
- Are they still appropriate?
- Might any need to be updated?

Review the activities you identified to address each strategy.
- Did they accomplish what you hoped?
- Is there a need for updating?

Review your benchmarks.
- Are they measuring what you hoped?
- Do you need to reset or revise?

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<table>
<thead>
<tr>
<th>Career and Technical Education Improvement</th>
<th>Updated Date</th>
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<tbody>
<tr>
<td><strong>Goal:</strong></td>
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<tr>
<td><strong>Evidence Base:</strong></td>
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<table>
<thead>
<tr>
<th>Benchmarks</th>
<th>Strategies for Success</th>
<th>Activities</th>
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<td>1</td>
<td>1</td>
<td>A. B. C.</td>
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<td>A. B. C.</td>
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<td>A. B. C.</td>
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<td>A. B. C.</td>
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### Act: Moderate Your Planning

<table>
<thead>
<tr>
<th>Short-Term Outcomes (e.g., 1 year)</th>
<th>Middle-Term Outcomes (e.g., 2–3 years)</th>
<th>Long-Term Outcomes (e.g., 4+ years)</th>
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<tbody>
<tr>
<td>• CTE participation rates</td>
<td>• CTE concentrator rates</td>
<td>• Graduation</td>
</tr>
<tr>
<td>• Ninth grade on track to graduate</td>
<td>• Work-based learning rates</td>
<td>• Employment placement</td>
</tr>
<tr>
<td>• Academic</td>
<td>• Dual-credit attainment</td>
<td>• Postsecondary enrollment</td>
</tr>
<tr>
<td>• Career and technical student organization engagement</td>
<td>• Cumulative grade point average</td>
<td>• Retention in work or postsecondary</td>
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<td>• Industry certifications</td>
<td>• Career satisfaction</td>
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### Act: Planning for Different Purposes

<table>
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<tr>
<th>Local Outcomes (Secondary)</th>
<th>Local Outcomes (Postsecondary)</th>
<th>State-Level Outcomes</th>
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<tbody>
<tr>
<td>Enhancing career readiness</td>
<td>Job-specific training</td>
<td>Economic development</td>
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<tr>
<td>Expanding career exposure</td>
<td>Industry credentialing</td>
<td>Reduced social services</td>
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<tr>
<td>Seamless post-program transitions</td>
<td>Employment</td>
<td>Increased revenue</td>
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**CTE Career & Technical Education RESEARCH NETWORK**
Act: Engage Educators

- Build buy-in among CTE stakeholders.
  - Involve stakeholders in reviewing data.
  - Convene educators to fine-tune activities.
- Share findings on a regular basis.
  - Translate complex data into usable information.
  - Create dashboards to publicize results.
Share CTE performance data.
• Educators review CTE data in collaboration with regional partners.
• Identify areas for improvement.

Create action plan.
• Establish up to a 5-year plan.
• Individualized technical assistance is provided by state staff.
Act: California Community Colleges

- Survey of community college completers
  - Administer following exit.
  - Assess employment outcomes.
- Effects
  - Hourly wages
  - Work status (i.e., employed part-time or full-time)
  - Work term (i.e., temporary, permanent)

California Community Colleges Produce Positive Employment Outcomes: Results from the Career Technical Education Outcomes Survey: https://doi.org/10.1080/10668926.2019.1650843
Closing Activity, Resources, and Contact Information
How might you use the information in this module to use data and research to improve CTE programs?

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


Activity handouts 1–5
Contact Information

CAREER AND TECHNICAL EDUCATION RESEARCH NETWORK

CTEResearchNetwork@air.org
Website: https://cteresearchnetwork.org/