



Career &
Technical Education

Using Data to Identify and Address CTE Opportunity Gaps

Participant Workbook

Introduction

The promise of Career and Technical Education (CTE) is to provide opportunities for each learner to follow their passion and achieve career goals and future economic success. While high-quality CTE programs of study across the country are delivering positive outcomes for learners, the reality is that not all learners have access to these programs. The Strengthening Career and Technical Education for the 21st Century Act (Perkins V) elevated the importance of access and equity and has challenged states and local recipients to prioritize this work to address identified gaps.

Aligning to the Arizona Department of Education's mission to advance equity and excellence for all students by serving school leaders, educators and staff, collaborating with communities, and leading with data-driven best practices, this workshop is designed to facilitate a process for local school districts to examine their CTE enrollment data to identify and address opportunity gaps. Through an inquiry-based approach, school districts will be able to identify and prioritize root causes, explore evidence-based intervention strategies, and propose specific action steps to address those gaps. This workshop is designed to launch data-driven and deep discussions within local communities, including those currently underserved by CTE, and to provide insight and propel meaningful action to enhance access to CTE opportunities for each learner.

This workshop and workbook are adapted from materials provided by Advance CTE.



**Career &
Technical Education**

Arizona Department of Education Mission:

We are a service organization committed to raising academic outcomes and empowering parents.

Section 1: Orientation to Equity in CTE

Diversity, Equity, and Inclusion

How would you define the following terms?

Diversity

Representation, composition. A wide range of qualities and attributes within a person, group, or community. In CTE, the special populations and subgroups that are described in this section are the typical ways that we consider diversity.

In your own words...

Inclusion

Acknowledging and valuing people's differences so as to enrich or shift social planning, decision-making, and quality of life for everyone.

In your own words...

Equity

Fairness in outcomes, creating just outcomes, giving everyone what they need to be successful. Acknowledging everyone's unique situation and addressing historical and current-day systematic barriers. Contrast with Equality, in which everyone is treated the same.

In your own words...

Key Terms & Definitions

Access	The ways in which educational institutions and policies ensure that learners have equal opportunities to participate in and take full advantage of their education. Access depends on factors such as geography, resources, academic preparation and awareness.
Equality	An approach to distributing resources and opportunities proportionally without consideration of differences in needs.
Implicit Bias	Attitudes or stereotypes that affect our understanding, actions and decisions in an unconscious manner. These biases, which encompass both favorable and unfavorable assessments, are activated involuntarily and without an individual's awareness or intentional control.
Non-traditional Fields	As defined by Perkins V, occupations or fields of work for which individuals from one gender comprises less than 25 percent of individuals employed in such occupation or field of work.
Opportunity Gap	An observable disparity in access and/or outcomes for a specific subgroup or special population. These gaps are due to systemic inequities, implicit biases, stereotypes, and outright discrimination based on group identities.
Percentage-Point Gap Analysis	An analysis that reveals whether or not the individuals in a specific program are proportionally representative of the demographics of their broader community.
Root Cause Analysis	A method of problem solving designed to uncover the deepest root(s) and most basic reasons for identified concerns.
Special Populations	Nine special populations recognized in Perkins V: (A) individuals with disabilities; (B) individuals from economically disadvantaged families, including low-income youth and adults; (C) individuals preparing for fields that are non-traditional for their gender; (D) single parents, including single pregnant women; (E) out-of-workforce individuals; (F) English learners; (G) individuals experiencing homelessness; (H) youth who are in, or have aged out of, the foster care system; and (I) youth with a parent who is a member of the armed forces and is on active duty.
Subgroups	A population of individuals with a common identity, often used when disaggregating and analyzing data. CTE data is often disaggregated by the following racial, ethnic and gender subgroups: Black learners, Native American learners, Asian learners, Pacific Islander learners, Hispanic/Latino learners, White learners, male learners and female learners.

Equity-Minded Principles

Having the right mindset is important when we approach equity work in education. Otherwise, we risk carrying our own biases into the work and ultimately may end up doing more harm than good. Examining opportunity gaps requires making a critical examination of the systems, policies and practices that limit learner success, including the roles we as individuals play in furthering them.

The three components to being an equity-minded leader are:

1. Being race-conscious – noticing and questioning patterns of educational outcomes that reveal opportunity gaps and viewing inequities in the context of a history of exclusion and discrimination.
2. Being aware that beliefs, expectations, and practices can be racialized unintentionally through implicit biases.
3. Being willing to actively work to dismantle systems that perpetuate inequity.

Once we adopt these principles, we can more effectively identify the root causes of CTE opportunity gaps and create an evidence-based action plan. The following exercise is designed to encourage participants to think about problems of practice — and locate barriers in policies, practices and systems — rather than focus on learner deficits.

When we take a strengths-based approach to opportunity gap analysis, we start by recognizing and celebrating learners' individual strengths and then locating the problems in the systems and structures that keep them from realizing their full potential. Instead of saying, "They just don't want to join this program," maybe we should start by asking, "Who is missing out because they have not been invited or don't feel welcome in this program?"

Deficit-Based Thinking: Locating the source of a problem in individual decisions or preferences – in other words, blaming the learner.

Strength-Based Thinking: Recognizing and celebrating learners' strengths and locating root causes in systems and structures.

For this workshop, shifting our mindsets from deficit-based thinking to strength-based thinking is important. In root cause analysis, it is easy to blame the learner (deficit-based thinking). Using a strength-based thinking approach, however, helps to center the learner's strengths and focus attention on the truest and deepest causes of the opportunity gap.

Activity: Deficit-based and Strength-based Thinking

In this activity, we want to shift our thinking and our language from deficit-based to strength-based thinking. Below is a list of stereotypes and perceptions about CTE learners, families, and programs that may be present in your school. How can you reframe these statements using a strength-based thinking lens? Write your revised responses in the “Strength-based thinking” column.

Deficit-based Thinking	Strength-based Thinking
Example: “The reason that there are only boys in my welding program is because girls just aren’t interested in welding.”	Example: “There are girls in our school that would excel in welding, but they don’t feel welcome in these programs and haven’t been invited in.”
We have tried to get parents more information about our CTE programs, but they never show up to our open houses.	
This program is too rigorous for some students. They don’t have the motivation or the academic knowledge to make it in my classes.	
CTE just isn’t valued in their culture. That’s why we never get “those” students in our programs.	
This program is too rough for students who don’t like to get their hands dirty.	
We always get a lot of interest in my program at the beginning of the year, but as soon as students find out how much they have to pay for equipment and exam fees, they back out.	

Section 2: Conducting a Percentage Point Gap Analysis

What is a percentage-point gap analysis?

One indication of an equitable CTE program is parity between the learners in the program and the broader population. If there were no barriers to access, we would expect the learners enrolled in CTE programs to reflect the demographics of the learners in the school, district, broader community.

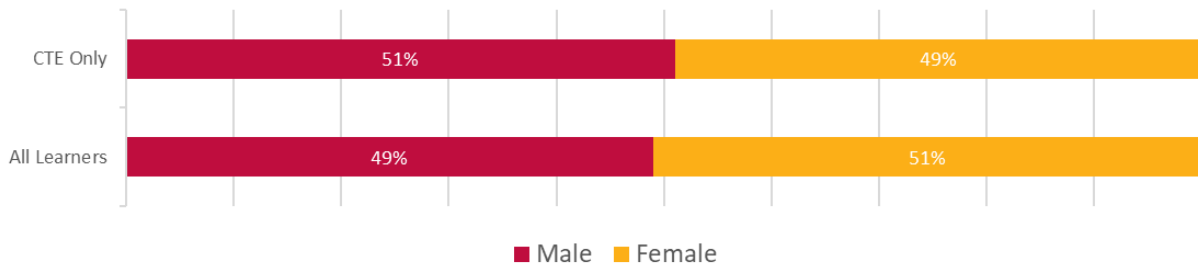
Conducting a percentage-point gap analysis reveals whether or not CTE learners are proportionally representative of their community. This analysis can also reveal the programs with the largest disparities and help prioritize interventions. The table below illustrates how to conduct this analysis.

Step	Example
1. Calculate the overall percentage of learners in each subgroup or special population in the school or community.	<p>There are 500 learners in grades 9 – 12 enrolled in Arizona Union High School. Out of those learners, 50 are classified as individuals with a disability.</p> $\frac{50}{500} = 0.1 \text{ or } 10\%$ <p>Interpretation: In total, 10% of grade 9 – 12 learners in this school are students with a disability.</p>
2. Calculate the percentage of CTE learners in each subgroup/special population.	<p>Arizona Union High School has three CTE programs: Welding, Medical Assisting Services, and Culinary Arts. Out of the 60 total CTE learners in Welding, three are students with a disability.</p> $\frac{3}{60} = 0.05 \text{ or } 5\%$ <p>Interpretation: Out of 60 CTE learners in the Welding program, 5% are students with a disability.</p>
3. Calculate the difference between the percentages to find the percentage-point gap.	<p>Out of all of the learners in Arizona Union High School, 10% are classified as students with a disability. Only 5% of learners enrolled in the Welding program at this school are classified as such.</p> $10\% - 5\% = 5 \text{ percentage points}$ <p>Interpretation: In Arizona Union High School, students with a disability are <i>under-represented</i> by 5 percentage points.</p>

Examples of Opportunity Gaps by Subgroup

The following graph represents gender data for the fictitious Arizona Union High School.

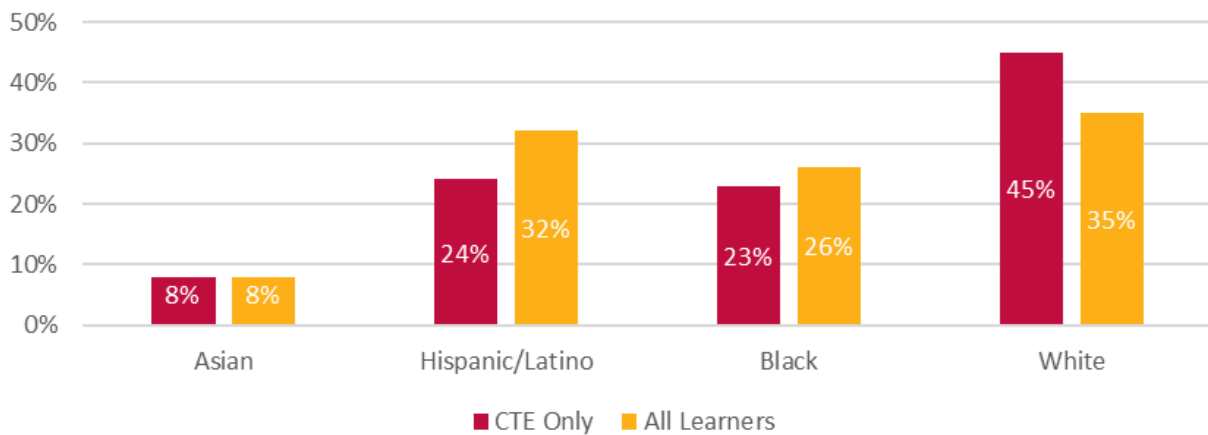
CTE Enrollment Compared to School Demographics by Gender



Interpretation: In this example, female learners are *under-represented* by two percentage points in CTE compared to all grade 9 – 12 learners in the school population. Conversely, male learners are *over-represented* by two percentage points in CTE compared to all grade 9 – 12 learners in the school population.

The following graph represents race/ethnicity data for the fictitious Arizona Union High School.

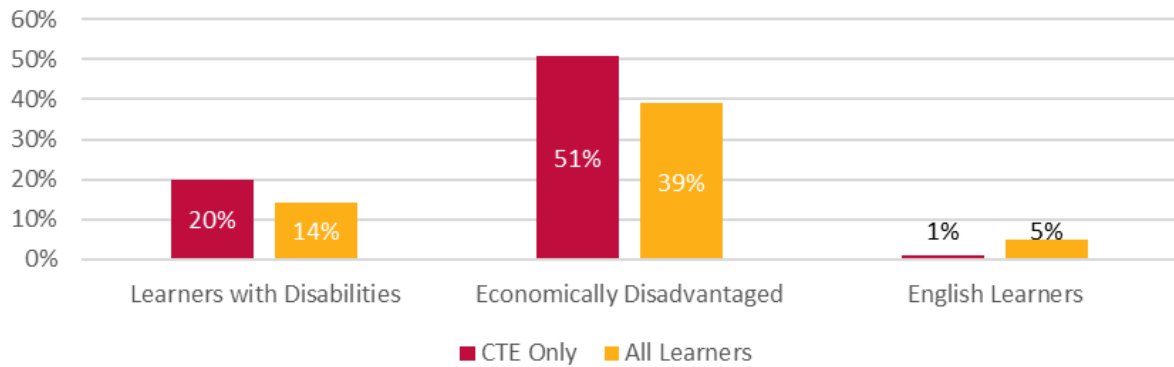
CTE Enrollment Compared to School Demographics by Race/Ethnicity



Interpretation: Hispanic/Latino learners are under-represented by 8 percentage points compared to all learners. Black or African American learners are under-represented by 3 percentage points compared to all learners. White learners in CTE are over-represented by 10 percentage points.

The following graph represents subgroup data for the fictitious Arizona Union High School.

CTE Enrollment Compared to School Demographics by Special Population



Interpretation: Students with disabilities are over-represented by 6 percentage points compared to all learners. Economically disadvantaged students are over-represented by 12 percentage points. English learners are under-represented by 4 percentage points.

Visualizations of CTE enrollment data can be helpful tools in describing the opportunity gaps that may exist. Such graphics give a clear idea of what information means by giving it a visual context in which gaps can be clearly seen in the sizes of bars in bar graphs, slices of a pie chart, directions of lines in line graphs, etc. Representation of data in this manner makes it easier and more natural for us to comprehend and make is easier to identify trends, patters, and outliers in our data.

Section 3: Your Local Data

The Arizona Department of Education has prepared for each school district, charter school, or career and technical education district (CTED) that maintains approved CTE programs a report that includes all pertinent information to conduct a percentage-point analysis. This report, called the “Opportunity Gap Analysis Report” was created using data reported to the department through the CTE Data Portal online reporting system for CTE enrollment and using data reported through the Arizona Education Learning and Accountability System (AELAS) and Arizona Education Data Standards (AzEDS) systems for school enrollment and demographic information.

All CTE students reported in the CTE Data Portal were included in the analysis. For school-wide populations, students with enrollment at the specific school on either of the CTE “data capture dates” (October 15 or February 15) were included in the analysis. The opportunity gap analysis report was created for each school or CTED campus that reported data to ADE-CTE through the CTE Data Portal. Please note that minor discrepancies in counts for special populations may occur depending on how and when data was reported to the Department.

The Opportunity Gap Analysis Report consists of three pages which should be viewed in conjunction with each other:

Page 1: Enrollment

- This page shows the total enrollment counts for the entire school, for CTE, and by each CTE program.

Page 2: Enrollment Percentages

- This page shows the percentages of enrollment for each subgroup and special population for the entire school, for CTE, and by each CTE program.

Page 3: “Heatmap” or Percentage Point Differences

- This page shows the difference in percentages for CTE compared to the school-wide population and for each CTE program compared to the school-wide population.
- Differences of 10 percentage points or greater are highlighted in blue (overrepresented)
- Differences of -10 percentage points or fewer are highlighted in orange (underrepresented)

Important Note:

The Opportunity Gap Analysis Report contains n-sizes that may reveal personally identifiable information (data that could potentially identify a specific individual) and are not intended for public viewing. For public reports, n-sizes of less than 11 should be redacted.

Example of Page 3 of the Opportunity Gap Analysis Report

District: _____
 School: _____

Opportunity Gap Analysis Report

Career and Technical Education

Date: _____

Percentage of Enrollment for entire school, including CTE students

Source: student enrollment/membership reported to ADE; student count is deduplicated

Gender	Race/Ethnicity								Special Populations						
Female	Male	Native American	Asian	Black or African American	Hispanic/Latino	Pacific Islander	Two or More Races	White	Students With a Disability	Economically Disadvantaged	Single Parent	English Learner	Homeless Individual	Foster Care	Military Parent
59.48%	40.52%	0.94%	2.34%	15.93%	48.24%	0.70%	3.04%	28.81%	10.30%	23.19%	0.00%	0.00%	0.47%	0.00%	0.00%

Difference in Enrollment in all CTE Programs

Source: student enrollment reported to ADE through the CTE Data Portal; student count is deduplicated

Gender	Race/Ethnicity								Special Populations						
Female	Male	Native American	Asian	Black or African American	Hispanic/Latino	Pacific Islander	Two or More Races	White	Students With a Disability	Economically Disadvantaged	Single Parent	English Learner	Homeless Individual	Foster Care	Military Parent
0.52%	-0.52%	-0.94%	4.32%	-2.59%	-1.58%	-0.70%	-3.04%	4.53%	3.03%	-23.19%	0.00%	0.00%	-0.47%	0.00%	0.00%

Difference in Enrollment by CTE Program

Source: student enrollment reported to ADE through the CTE Data Portal; students may be counted more than once if enrolled in multiple programs

Orange = Underrepresentation 10+% Blue = Overrepresentation 10+%

Gender	Race/Ethnicity								Special Populations						
Female	Male	Native American	Asian	Black or African American	Hispanic/Latino	Pacific Islander	Two or More Races	White	Students With a Disability	Economically Disadvantaged	Single Parent	English Learner	Homeless Individual	Foster Care	Military Parent
Aesthetics	40.52%	-40.52%	-0.94%	-2.34%	-15.93%	-48.24%	-0.70%	-3.04%	71.19%	-10.30%	-23.19%	0.00%	0.00%	-0.47%	0.00%
Aircraft Mechanics	-59.48%	59.48%	-0.94%	-2.34%	-15.93%	-48.24%	-0.70%	-3.04%	71.19%	-10.30%	-23.19%	0.00%	0.00%	-0.47%	0.00%
Automotive Technologies	-59.48%	59.48%	-0.94%	-2.34%	-15.93%	-48.24%	-0.70%	-3.04%	71.19%	89.70%	-23.19%	0.00%	0.00%	-0.47%	0.00%
Cosmetology and Related Services	40.52%	-40.52%	-0.94%	-2.34%	-15.93%	51.76%	-0.70%	-3.04%	-28.81%	-10.30%	-23.19%	0.00%	0.00%	-0.47%	0.00%
Emergency Medical Services	40.52%	-40.52%	-0.94%	-2.34%	-15.93%	-48.24%	-0.70%	-3.04%	71.19%	-10.30%	-23.19%	0.00%	0.00%	-0.47%	0.00%
Medical Assisting Services	-9.48%	9.48%	-0.94%	47.66%	34.07%	-48.24%	-0.70%	-3.04%	-28.81%	-10.30%	-23.19%	0.00%	0.00%	-0.47%	0.00%
Network Security	-59.48%	59.48%	-0.94%	-2.34%	-15.93%	51.76%	-0.70%	-3.04%	-28.81%	-10.30%	-23.19%	0.00%	0.00%	-0.47%	0.00%
Physical Therapy Assistant	40.52%	-40.52%	-0.94%	-2.34%	-15.93%	51.76%	-0.70%	-3.04%	-28.81%	39.70%	-23.19%	0.00%	0.00%	-0.47%	0.00%
Software and App Design	-9.48%	9.48%	-0.94%	-2.34%	-15.93%	1.76%	-0.70%	-3.04%	21.19%	-10.30%	-23.19%	0.00%	0.00%	-0.47%	0.00%
Veterinary Assisting	40.52%	-40.52%	-0.94%	-2.34%	34.07%	1.76%	-0.70%	-3.04%	-28.81%	-10.30%	-23.19%	0.00%	0.00%	-0.47%	0.00%
Welding Technologies	-59.48%	59.48%	-0.94%	-2.34%	-15.93%	51.76%	-0.70%	-3.04%	-28.81%	-10.30%	-23.19%	0.00%	0.00%	-0.47%	0.00%

Reviewing Local Data

Looking at your Opportunity Gap Analysis Report, discuss the following questions:

Questions about the data

1. Overall, to what extent does the diversity of the CTE learner population reflect the diversity of your comparison population?

2. List the specific subgroups and special populations that are under-represented in CTE overall.

3. List the specific subgroups and special populations that are over-represented in CTE overall.

4. List the CTE programs in which enrollment by learner subgroup and special population is proportional to the comparison population's demographics (as close to 0 percentage points as possible).

5. List all the CTE programs that have one or more subgroup and/or special population that are under-represented, include which subgroup or special population are under-represented.

6. List all the CTE programs that have one or more subgroup and/or special population that are over-represented, include which subgroup or special population are over-represented.

Other questions for discussion

7. What surprised you about the data?
8. In what areas do you think you are doing well serving all learners?

Section 4: Identifying Opportunity Gaps

An Opportunity Gap occurs when specific subgroups or special populations of learners have disproportionate access or lack of access to high-quality learning opportunities or when the environmental conditions are insufficient for specific subgroups to be successful. These gaps result from systemic, structural and social barriers such as admissions policies, implicit bias, stereotyping or insufficient funding. The first sign of an opportunity gap in CTE is when learners are disproportionately enrolled in CTE by their subgroup or special population status.

Using the data in your Opportunity Gap Analysis Report, identify **five opportunity gaps** for further examination. Consider the following:

- Who is most affected?
- What is the direction and degree of the opportunity gap?
- Where does the gap occur?
- When does the gap occur?

Opportunity Gap Example

Who: Hispanic/Latino learners

What: Under-represented by 8 points

Where: In the welding program

When: in the 2021-2022 school year

At this step, don't focus on causes of the opportunity gap – simply use the data to make statements such as the one in the example box above.

To prioritize your opportunity gaps, consider focusing on the following:

- Programs with the most sizable gaps
- The most popular programs/programs with highest enrollment
- Programs that do not have a compromising n-size (typically fewer than 11 students)
- Programs with gaps that affect multiple learner groups
- Gaps that are unexpected and/or are not currently being addressed

Programs with low enrollment may be largely under- or over-represented in many subgroups and/or special populations due to the small n-size – you should still examine these programs for opportunity gaps, but keep in mind that some gaps may not be due to lack of access but simply due to the low enrollment.

Write your opportunity gaps on the next page.

Write your five gaps here:

Opportunity Gap 1:

Opportunity Gap 2:

Opportunity Gap 3:

Opportunity Gap 4:

Opportunity Gap 5:

Section 5: Brainstorming Root Causes

Conducting a Root Cause Analysis

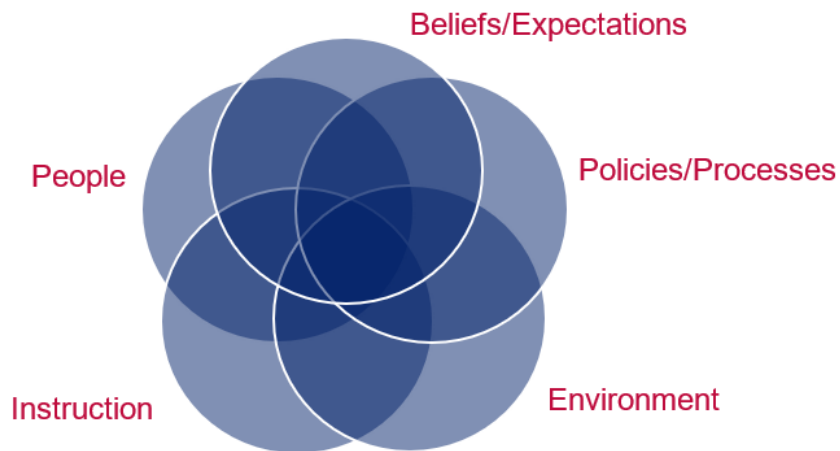
A **root cause analysis** is a method of problem solving designed to uncover the deepest root(s) and most foundational reasons for the identified concerns. It is an effective tool to investigate and uncover the cause(s) of a problem rather than treat symptoms of the problem. Following the identification of root causes, strategies can be deployed to change policies or shift investments and resources to move to solutions that can have transformative impacts. A root cause analysis induces discussion and reflection with conversations grounded in data. The process includes open and honest deliberations in a brave, collaborative environment to foster examination of data and brainstorm potential causes of the identified opportunity gap.

A systems approach is critical to identify root causes. Systems are composed of an organized array of interdependent and interacting components. While you may start with identifying specific individual parts, as this analysis unfolds you will note how these different parts are interacting. One way to organize this systems approach for the root cause analysis for the opportunity gaps identified is listed on page 22. Some root causes may cross categories and may not seem to fit discretely into a specific category. These categories are merely an organizational tool to help you consider all possible causes through various lenses.

There is a human tendency to blame individuals (or their families) for the problems they experience, but root causes are typically systemic. Yes, there may be individual differences between two students in their interest, motivation, commitment and family support. However, the group differences that are revealed by the gap analysis point to systemic, not individual, factors that create barriers and different opportunities.

Another human tendency is to blame the individual's culture — to see the gap as reflective of a deficit in the person's culture or cultural beliefs. However, a root cause analysis calls for “decentering” — seeing things from the perspective of the groups that are under-represented, understanding their experiences from their vantage point, and not pathologizing or blaming them or their culture. If we do not take this stance, we sometimes end up blaming groups for the biases and stereotypes that have been inflicted on them, i.e., we “blame the victim.”

Root Cause Themes in CTE



Beliefs/Expectations	The broader expectations and values in relation to CTE itself and/or to specific learner groups. This category is where we may see examples of implicit bias, CTE stigma and stereotypes about particular groups.
Policies/Processes	State, district and/or institutional policies and procedures that create barriers to access or success in CTE programs. This category may include admission requirements, scheduling barriers or funding limitations.
Environment	The geographic and/or socioeconomic factors that affect access and/or prevent learners from realizing their education and career goals. This category may include lack of access to equipment, financial barriers and/or transportation.
Instruction	The barriers to teaching and learning in the CTE classroom such as lack of accommodations for students with disabilities, teaching strategies that are not inclusive, bias in the curriculum, or insufficient academic preparation prior to entering the CTE program.
People	Barriers related to staffing — such as insufficient numbers of school counselors or career advisers, shortages of qualified teachers and faculty, and/or lack of leadership capacity — or lack of representational diversity in the CTE teacher workforce and among industry partners.

Activity: Root Cause Analysis Example

Opportunity Gap:

Hispanic/Latino learners are under-represented by 27 percentage points in the Architectural Technology program in 2021-2022 school year.

Possible Causes:

- Hispanic/Latino families are not aware of this CTE program (*beliefs/expectations*)
- This CTE program is not located in the communities where most Hispanic/Latino families reside (*environment*)
- Recruitment material for this program is provided in English only (*policies/processes*)
- The high school where this program is located has only one, part-time Hispanic/Latino teacher. (*people*)

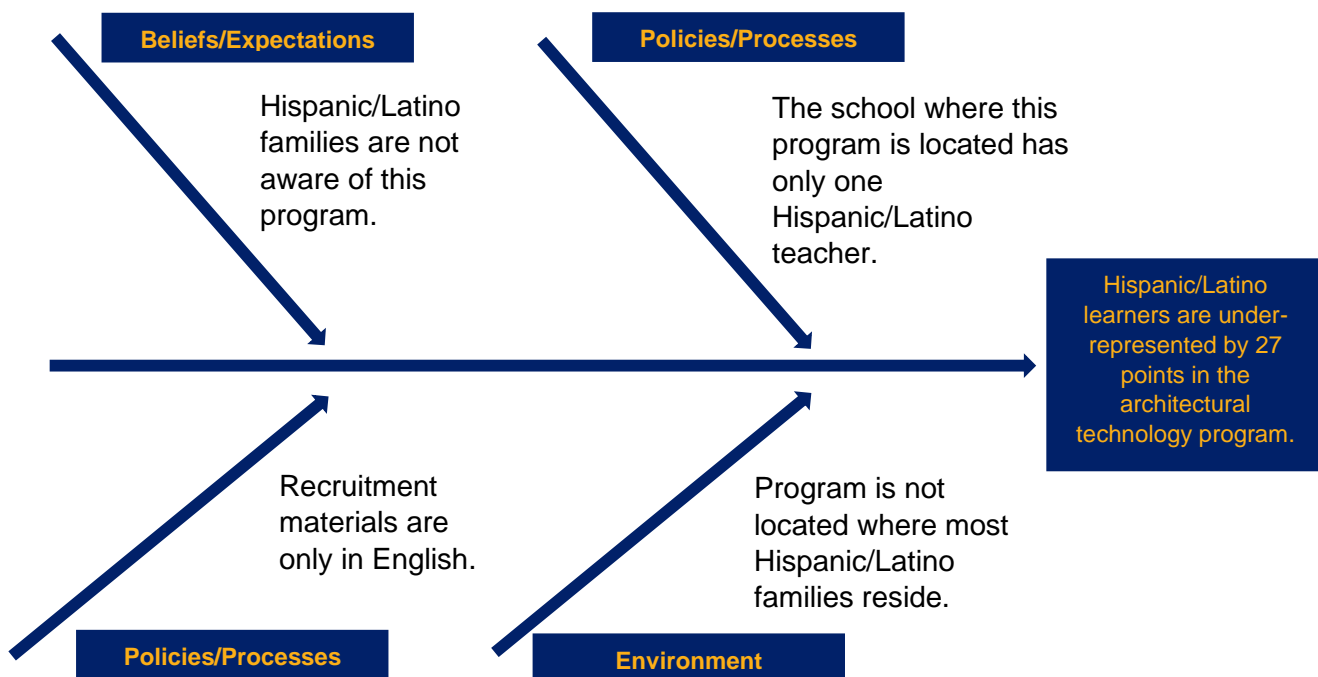
Individual Brainstorming:

Using the opportunity gap statement above, discuss within your group any and all possible causes you can think of for this opportunity gap. List them here:

Using a Fishbone Diagram

A **fishbone diagram** is a visual way to brainstorm and identify possible causes of a problem by sorting ideas into useful categories. The problem, in our case identified as the “opportunity gap,” is displayed at the head of the fish. Possible causes are listed on the smaller bones under various categories. Team members work collaboratively to brainstorm, question and consider alternative causes from various perspectives during this exercise. The fishbone diagram can be helpful in identifying causes that might not have been considered by pushing participants to ask questions and dig beyond the surface to better understand systems and underlying processes that may be contributing to and/or causing the identified opportunity gap. More than one root cause can be identified through this approach.

Below is an example of some of the ideas for the example opportunity gap. Ideas are placed into categories to better understand potential causes for this gap.



A number of factors can result in disparities in enrollment. Thinking of root causes in terms of systems-level barriers is helpful. These barriers can include those related to **beliefs/expectations, policies/processes, environment, instruction, or people**. Use a fishbone diagram to list the major root causes identified in a root cause analysis. The root causes should result in the opportunity gap at the “head” of the diagram.

Section 6: Practical Strategies to Improve Access and Equity

Understanding Different Levels of Evidence

The next step in developing an equity action plan is to identify impactful strategies that will help you close opportunity gaps. The best place to start is with existing evidence. Learning how other states, districts, and schools addressed similar opportunity gaps helps ensure that your plan of action will lead to the desired outcomes.

When evaluating whether a strategy can effectively close opportunity gaps, practitioners often seek research or evidence-based practices. These are practices that have been proven to work — through rigorous experimental or quasi-experimental studies or even just early anecdotal evidence.

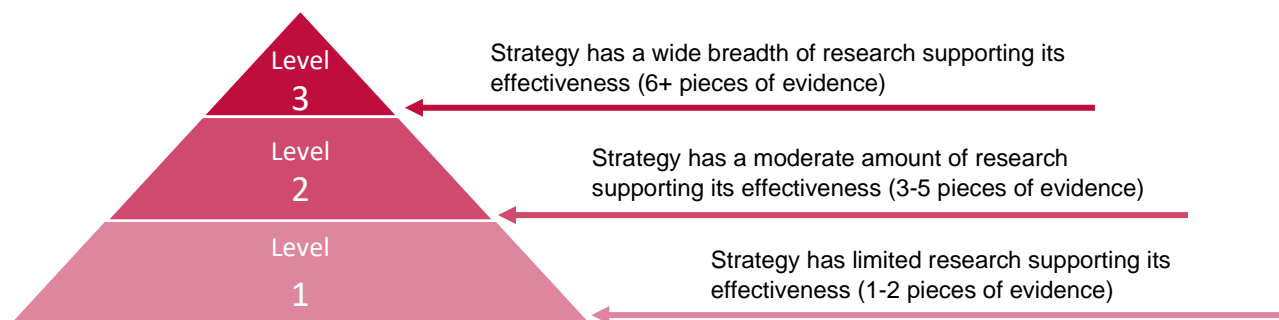
Not all strategies have the same base of evidence to support their effectiveness. As practitioners seeking to implement evidence-based strategies, differentiating levels of evidence before committing to a particular strategy is important.

Consider the following when examining evidence:

- **The rigor of the analysis:** Does the study use descriptive or inferential statistics to draw conclusions? What methodology was used?
- **The breadth of supporting evidence:** Is the evidence to support this strategy isolated or has it been validated across multiple studies/cases?
- **The effect size:** How big was the detected impact?
- **Face validity:** Does this strategy make practical sense?

Lack of evidence does not necessarily indicate a strategy is ineffective; it could simply mean that the research base has not yet been developed to determine its effectiveness. Plenty of practical strategies are widely used in classrooms and institutions across the country even though no formal evaluations have been conducted to date.

You can apply a three-level system to identify evidence-based practices that are based on the breadth of research supporting that particular intervention or strategy.



Practical Strategies for Closing Opportunity Gaps in CTE

The following table describes root causes and related strategies to improve equitable access to CTE. While most of these strategies have backing evidence supported by a broad literature review, a few have been demonstrated anecdotally but not rigorously.

Beliefs & Expectations

The broader expectations and values in relation to CTE itself and/or to specific learner groups. This category is where we may see example of implicit bias, CTE stigma, and stereotypes about particular groups.

Root Cause	<i>Good</i>	<i>Better</i>	<i>Best</i>
	Level 1 Strategies	Level 2 Strategies	Level 3 Strategies
Lack of Awareness about CTE	<ul style="list-style-type: none"> Develop recruitment materials and host recruitment events Require individual academic and career plans Engage key influencers (school counselors, teachers, CTE learners, alumni) to share information about CTE Provide informational materials in multiple languages 	<ul style="list-style-type: none"> Provide middle school CTE/career exploration curriculum and experiences Provide early high school CTE/career exploration curriculum and experiences 	<ul style="list-style-type: none"> Implement technology-based platforms for career exploration and planning
Implicit Bias/Stereotypes about particular learner group	<ul style="list-style-type: none"> Develop targeted recruitment materials and strategies Partner with media organizations to promote representations of diverse learners in different occupations Assign learners to counselors from the same racial group Develop inclusive recruitment materials and strategies that depict diverse learner populations 	<ul style="list-style-type: none"> Implement peer mentoring programs or peer support groups 	<ul style="list-style-type: none"> Implement inter-generational mentoring programs Provide professional development on implicit bias, stereotype threat, disability awareness, and more
CTE Stigma	<ul style="list-style-type: none"> Use learner and parent ambassadors to address outdated perceptions of CTE Use career exploration and planning platforms and recruitment materials to highlight the benefits of CTE 	<ul style="list-style-type: none"> Engage families in career development 	

Policies & Processes

State, district, and or school-level policies and procedures that create barriers to access or success in CTE programs. This category may include admission requirements, scheduling barriers, disciplinary barriers

Root Cause	<i>Good</i>	<i>Better</i>	<i>Best</i>
	Level 1 Strategies	Level 2 Strategies	Level 3 Strategies
Admission requirements	<ul style="list-style-type: none"> Eliminate admission requirements for CTE programs Reserve seats/spaces for targeted learner groups 		
Scheduling barriers	<ul style="list-style-type: none"> Provide courses and services in the evening and/or on weekends 	<ul style="list-style-type: none"> Schedule CTE courses to maximize access, considering graduation requirements and other requirements for students with disabilities and English learners 	<ul style="list-style-type: none"> Implement career academies or similar cohort-based, interdisciplinary models for high school learners
Disciplinary barriers		<ul style="list-style-type: none"> Ensure that educators, counselors, administrators, and other faculty and staff are trained on using trauma-informed practices to promote a culture of safety and support 	<ul style="list-style-type: none"> Implement school-wide positive behavior interventions and supports in the middle school or high school level
Lack of policies that support diversity	<ul style="list-style-type: none"> Develop and enforce non-discrimination policies Develop and enforce anti-bullying/anti-harassment policies Conduct learner surveys or focus group to evaluate whether programs are inclusive and welcoming for under-represented populations 		<ul style="list-style-type: none"> Use data to monitor enrollment patterns and identify opportunity gaps
Lack of systematic counseling and advisement	<ul style="list-style-type: none"> Provide proactive counseling/advising/career coaching Require individual academic and career plans Provide professional development for counselors/advisors on how CTE programs can prepare learners of all backgrounds for high-skill, high-wage, and in-demand employment opportunities 	<ul style="list-style-type: none"> Implement dropout prevention/early warning systems 	<ul style="list-style-type: none"> Implement online platforms for career exploration and planning

<p>Siloed departments and services</p>	<ul style="list-style-type: none"> • Structure secondary and postsecondary education to enable early entry into CTE programs 		<ul style="list-style-type: none"> • Implement career academies or similar cohort-based, interdisciplinary models • Implement postsecondary guided/accelerated pathways through program maps, intensive advising, and early warning systems • Implement sector-specific training programs scaffolded by career advisement, job placement, and financial/tangible supports, among other support services
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Environment

The geographic and/or socioeconomic factors that affect access and/or prevent learners from realizing their education and career goals. This category may include lack of access to equipment, financial barriers, and/or transportation.

	<i>Good</i>	<i>Better</i>	<i>Best</i>
Root Cause	Level 1 Strategies	Level 2 Strategies	Level 3 Strategies
Lack of access to relevant facilities and equipment	<ul style="list-style-type: none"> • Provide equipment that is inclusive for students with disabilities and various genders (differently sized protective equipment, etc.) • Share facilities and equipment with other learning providers and/or industry partners • Enact a one-to-one technology policy to scale up virtual or remote learning opportunities • Provide facilities that are inclusive for students with disabilities and various genders 		
Lack of access to qualified CTE instructors and/or industry partners	<ul style="list-style-type: none"> • Develop induction/mentoring programs for new instructors that build industry and/or pedagogical knowledge and skills • Provide virtual access to industry representatives, including through simulated work-based learning • Establish formal dual or concurrent enrollment partnerships with secondary and postsecondary institutions to give high school learners access to postsecondary instruction • Enable co-teaching/team teaching that pairs instructors with differing levels of experience/qualifications with industry experts • Provide virtual access to qualified instructors 	<ul style="list-style-type: none"> • Develop “grow your own” programs in the Education & Training Career Cluster • Provide externships for teachers and faculty that build industry knowledge and skills 	

<p>Financial barriers</p>	<ul style="list-style-type: none"> • Cover fees for industry-recognized credential assessments • Cover fees for Career and Technical Student Organizations (CTSO) activities • Provide financial aid for learners from low-income families that covers tuition, equipment, fees, etc. 		<ul style="list-style-type: none"> • Provide free/low-cost opportunities to earn articulated credit • Award credit for prior learning/military experience/work experience
<p>Tangible barriers</p>	<ul style="list-style-type: none"> • Provide case management/a single point of entry to non-academic support services • Provide transportation to the CTE program and/or work-based learning 	<ul style="list-style-type: none"> • Provide integrated learner services including health care, mental health services, meals/food pantry, childcare, academic services, etc. 	

Instruction

The barriers to teaching and learning in the CTE classroom such as a lack of accommodations for students with disabilities, teaching strategies that are not inclusive, bias in the curriculum, or insufficient academic preparation prior to entering the CTE program.

Root Cause	<i>Good</i> Level 1 Strategies	<i>Better</i> Level 2 Strategies	<i>Best</i> Level 3 Strategies
Lack of relevant, engaging, hands-on and work-based learning experiences	<ul style="list-style-type: none"> • Teach professional skills and employability skills in all CTE programs • Provide early career exploration opportunities to give learners the chance to try careers and develop their own occupational identity • Provide professional development for educators and industry partners to maximize these experiences • Expand access to paid, work-based learning opportunities so learners who assist in supporting their families can participate 		<ul style="list-style-type: none"> • Provide CTSOs that build technical, employability, and leadership skills through competitive events, service learning, and other activities • Provide work-based learning scaffolded by employability skills training and mentoring/coaching, among other support services • Provide virtual/simulated learning where real-world learning is not safe, legal, or accessible
Bias in instruction/curriculum	<ul style="list-style-type: none"> • Use culturally responsive curriculum • Employ microaffirmations through active listening, recognizing and validating experiences and affirming emotional reactions • Be sensitive to logos and imagery that perpetuate stereotypes 	<ul style="list-style-type: none"> • Implement an instructional approach that draws on a variety of teaching methods to ensure equal opportunities for all learners 	<ul style="list-style-type: none"> • Teach self-efficacy/self-determination and a growth mindset • Provide professional development on topics related to bias in instruction/curriculum
Barriers to learner progress	<ul style="list-style-type: none"> • Include CTE representatives on Individual Education Program/504 teams • Create space for peer affinity groups so that learners of similar identities can receive support and fellowship 	<ul style="list-style-type: none"> • Provide accommodations for students with disabilities and English learners • Implement peer tutoring 	<ul style="list-style-type: none"> • Implement bridge/remediation programs, often through contextualized academic-CTE curriculum and instruction

People

Barriers related to staffing – such as insufficient number of school counselors or career advisors, shortages of qualified teachers and faculty and/or lack of leadership capacity, lack of representational diversity in the CTE teacher workforce and among industry partners.

	<i>Good</i>	<i>Better</i>	<i>Best</i>
Root Cause	Level 1 Strategies	Level 2 Strategies	Level 3 Strategies
Lack of diversity in the CTE educator workforce	<ul style="list-style-type: none"> Develop more inclusive pipelines into leadership and administration 	<ul style="list-style-type: none"> Develop “grow your own” programs in the Education & Training Career Cluster 	<ul style="list-style-type: none"> Recruit diverse instructors through minority-serving institutions and affinity groups, among other methods
Lack of diversity among industry partners	<ul style="list-style-type: none"> Recruit diverse industry partners through affinity business groups, among other methods 		

Additional Resources to Identify Practical Strategies

- Achieving the Dream – Knowledge Center
 - <https://achievingthedream.org/latest/>
- American Youth Policy Forum – Topic Areas
 - <https://www.aypf.org/topic-areas/>
- Illinois Center for Specialized Professional Support – Super Strategies
 - <https://icsps.illinoisstate.edu/cte/special-populations/76-super-strategies>
- National Alliance for Partnerships in Equity – Root Causes and Strategies
 - <https://napequity.org/root/>
- National Center for Homeless Education – Homeless Education Research Briefs
 - <https://nche.ed.gov/resources/>
- Nebraska Department of Education – Strategies for Special Population Success: Practical Tips and Tools for Nebraska Educators (may still apply to Arizona educators)
 - <https://cdn.education.ne.gov/wp-content/uploads/2020/07/NE-Special-Populations-Brief-FINAL-WEB.pdf>
- MDRC – Center for Effective Career and Technical Education
 - <https://www.mdrc.org/project/mdrc-center-effective-career-and-technical-education#overview>

Section 7: Identifying Action Steps

Now that you have completed the root cause analysis and review of actionable evidence, it is time to identify some next steps to turn your ideas into action. Identifying challenges and opportunity gaps is one thing but identifying solutions and developing a plan and timeline to close them takes leadership, commitment and dedication to equity.

Action planning for equity can be difficult for a number of reasons:

- You may feel that the problems you face are out of your control or that you are unable to influence the outcomes you want to achieve
- New challenges may arise that require you to adapt your strategies
- The problems you want to address might be bigger than the CTE system itself can address (we understand that inequities in education begin long before students enter a CTE program)
- There may not be a consensus from everyone that these are the right solutions or that equity is a priority to begin with

Identifying Action Steps

When identifying action steps, consider your role and the level of influence you have in your department, school, district, or community. Separate action items into steps that you can take as an individual and steps that you believe that your organization and community can take.

List some of those steps here:

<input checked="" type="checkbox"/> Individual Action Steps	<input checked="" type="checkbox"/> Organizational Action Steps

Next Steps

It takes a team effort to realize the vision for equity in CTE: that each learner can access, feel welcome in, fully participate in and successfully complete a high-quality CTE program of study. The same systems that have limited access to high-quality CTE programs and created roadblock after roadblock for marginalized learners can be redesigned to ensure equity and access. In this workshop we have identified barriers to access and examined evidence-based research to select practical strategies for closing opportunity gaps.

But the work does not stop here. Equity is a process that takes persistence, dedication and commitment.

Each of us has a role to play in this effort. As you look ahead, consider the following commitments:

- Hold yourself accountable to practices, behaviors, and language that further equity instead of reinforcing historical barriers
- Put pressure on leaders in your community and your state to change inequitable policies and practices
- Hold yourself and your leaders accountable for following through on the action steps you and your organization have identified
- Engage learners, families, and representative of special populations to understand what they see as the most important/urgent barriers
- Continually monitor your data and keep an eye out for potential patterns of inequity
- **Incorporate your actions steps into your organization's comprehensive local needs assessment, strategic planning, and other local planning processes to push for equity**