Informing Improvements to Career and Technical Education Programs

Analytic and Applied Research Strategies for State and District Staff

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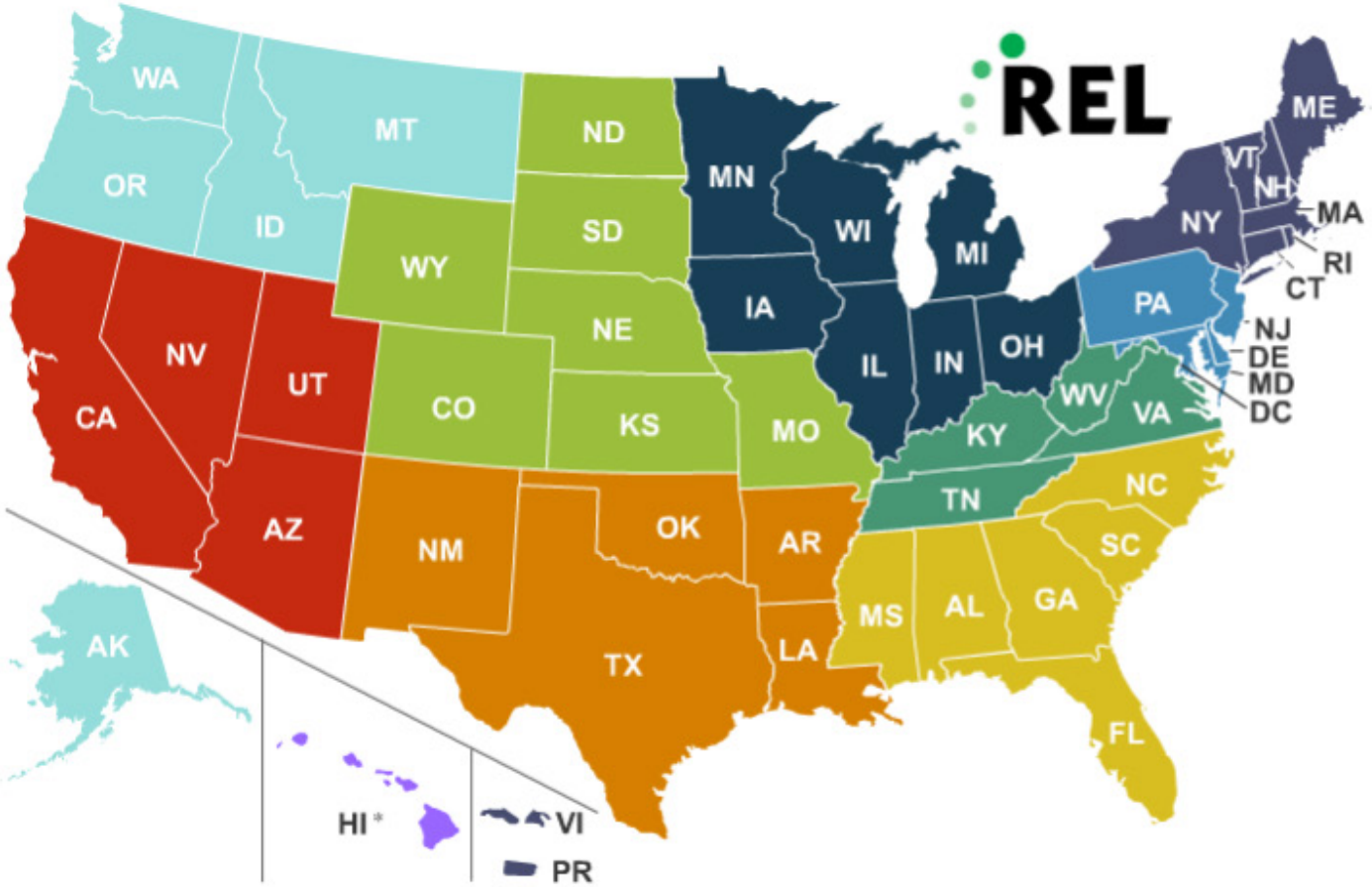
The Regional Educational Laboratories



Appalachia
Central
Mid-Atlantic
Midwest
NE & Islands
NW
Pacific*
SE
SW
West

* The Pacific Region contains Hawaii pictured on the map and American Samoa, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia (Chuuk, Kosrae, Pohnpei, & Yap), Guam, the Republic of the Marshall Islands, & the Republic of Palau not pictured on the map

The **10 RELs** work in partnership with stakeholders to **support a more evidence-based education system.**

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Find us on the web! https://ies.ed.gov/ncee/edlabs/regions/appalachia/

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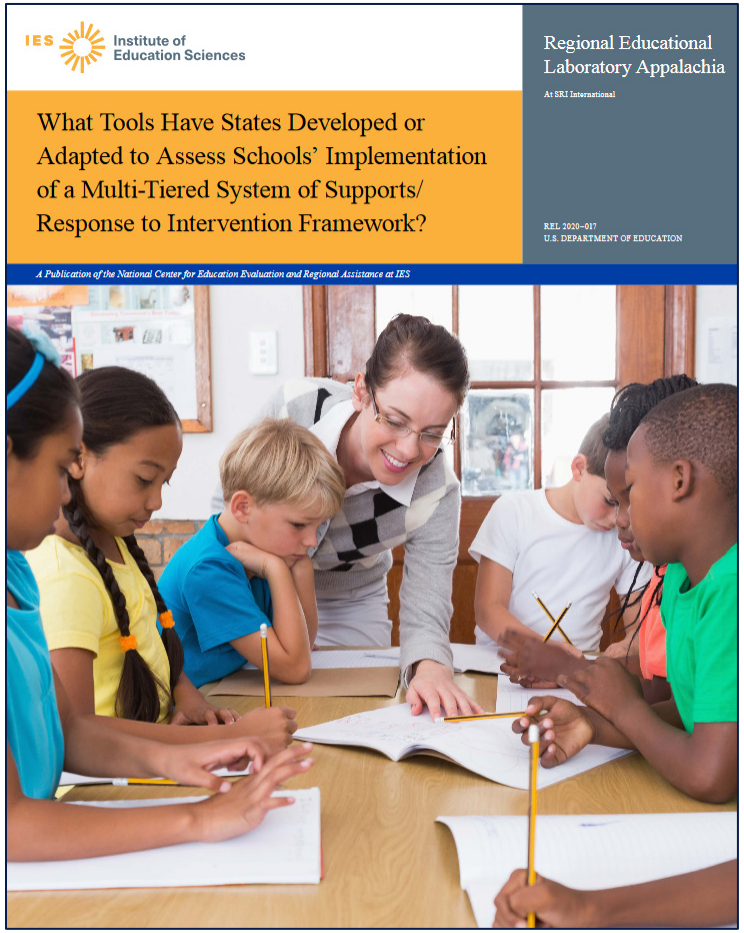
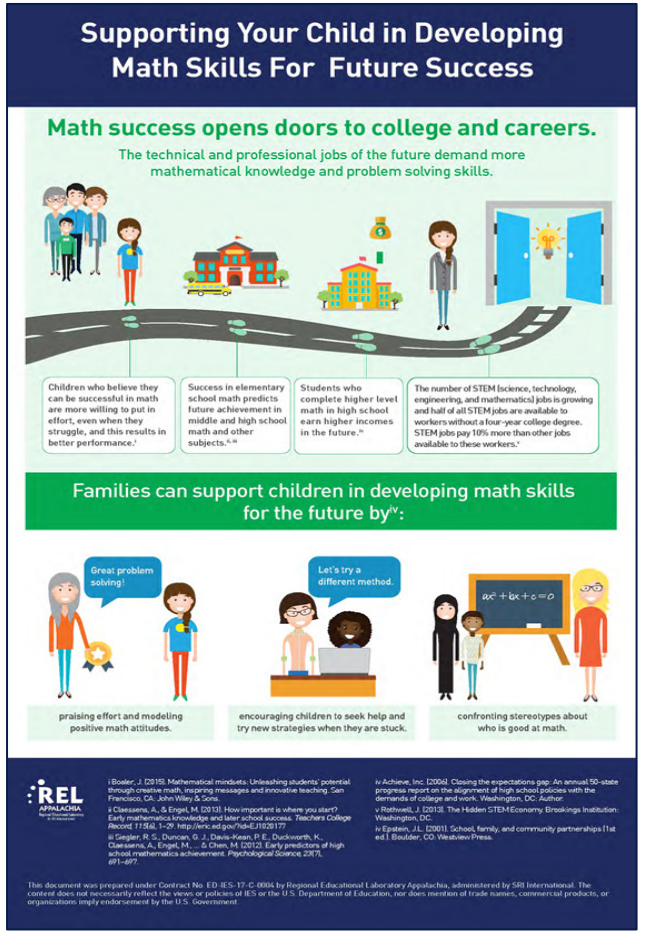
Applied Research



Training, Coaching, and Technical Support

Dissemination



Please share this information in the chat:

- Your location
- Your role in education

Welcome to Zoom!

- Tips for videoconferences:
  - Please join using video, if possible.
  - Use gallery view to see everyone on the call.
  - Please mute yourself when you aren't participating in the discussion.
  - Feel free to use the chat to participate in discussions, in addition to speaking using audio.

Meet the facilitators

Miya Warner
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American Institutes for Research

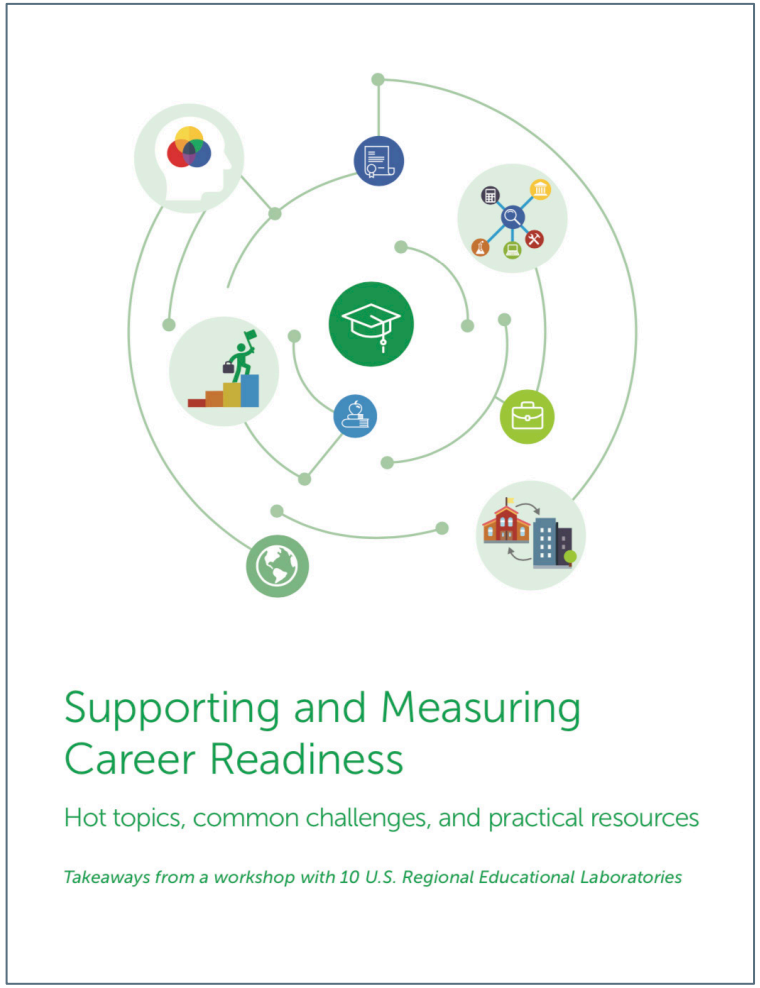
Agenda

- Welcome and introductions (5 minutes)
- Research study overviews (25 minutes)
- Breakout session 1 (25 minutes)
- Breakout session 2 (25 minutes)
- Share-out and wrap-up (10 minutes)

Background information and resources

- Supporting and Measuring Career Readiness Workshop
  - 23 REL staff from across all ten regions
  - Three expert panelists
- Resources
  - Career Readiness Measurement Literature Scan:

    https://ies.ed.gov/ncee/edlabs/regions/appalachia/events/materials/07-23-19-Career-Readiness-Lit-Scan-508.pdf
  - Meeting Summary:
    https://ies.ed.gov/ncee/edlabs/regions/appalachia/events/materials/supporting-and-measuring-career-readiness.pdf



Goals for today

- Understand the rationale for and potential benefits of examining Career and Technical Education (CTE) program and participant data.
- Learn about different use cases for examining CTE program or participant data, including assessing alignment of CTE programs to the labor market and understanding the postsecondary and employment outcomes of CTE participants.
- Explore examples of how states and districts—such as Oregon, West Virginia, and Round Rock Independent School District (RRISD) in Round Rock, Texas—are using data to inform improvements to their CTE programs.

Assessing the Alignment Between West Virginia's High School Career and Technical Education Programs and the Labor Market

Julie Harris
Senior Education Researcher
REL Appalachia at SRI International

Full report available at: https://ies.ed.gov/ncee/edlabs/projects/project.asp?projectID=4579

Why this study?

To understand the extent to which **CTE programs** in each region **align with high-demand occupations** so that WVDE can help keep students **on the path from high school career and technical education to future success**.

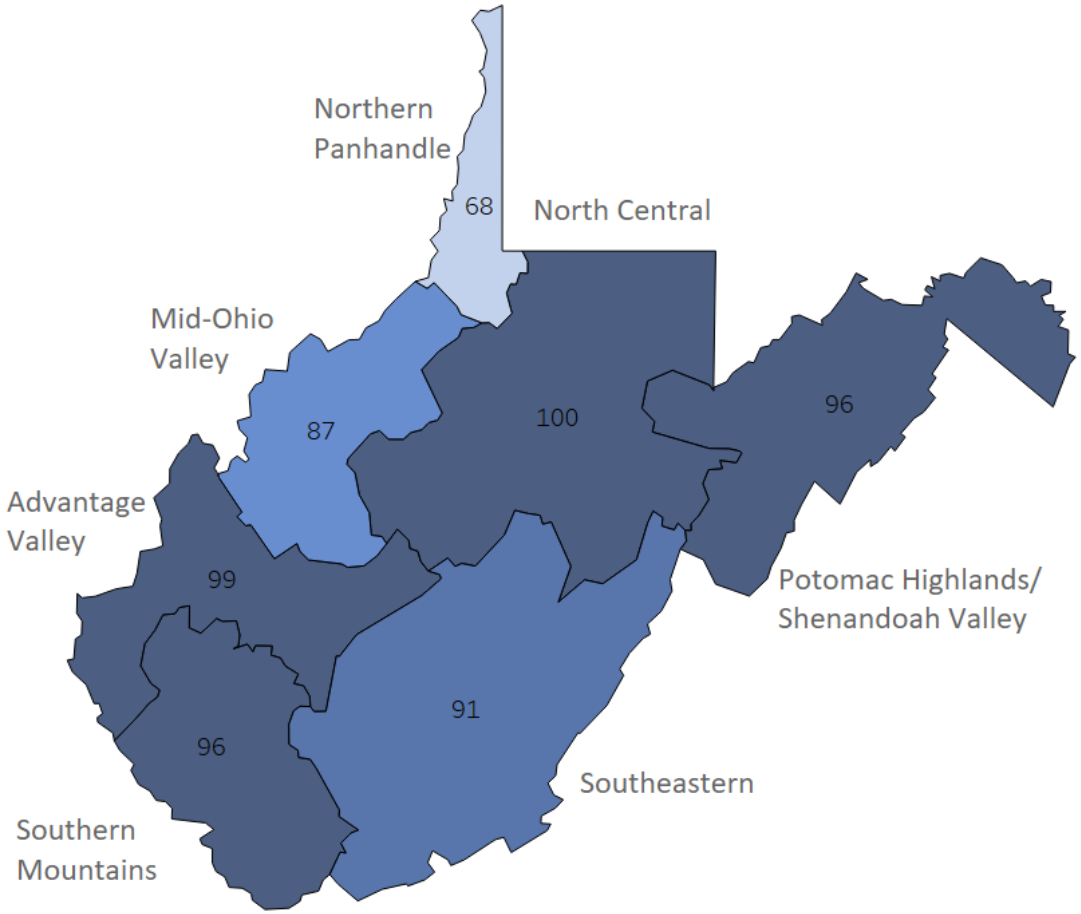
What did we do?

- Looked at the alignment between **available CTE programs** in each region of West Virginia and **regional high-demand occupations.**
- Using data from WVDE and the Bureau of Labor Statistics, calculated:
  - The **percentage of CTE program offerings** in the region aligned **to at least one of these high-demand occupations** in the region and statewide.
  - The **percentage of long-term employment openings** in these high-demand occupations that **have at least one aligned CTE program** in the region.

What did we learn?

- Regional CTE programs served, on average, **93 percent** of the projected regional employment openings in high-demand study occupations.
- Regional variation in the percentage of employment openings served **highlights a potential need for improvement** in the Northern Panhandle region.

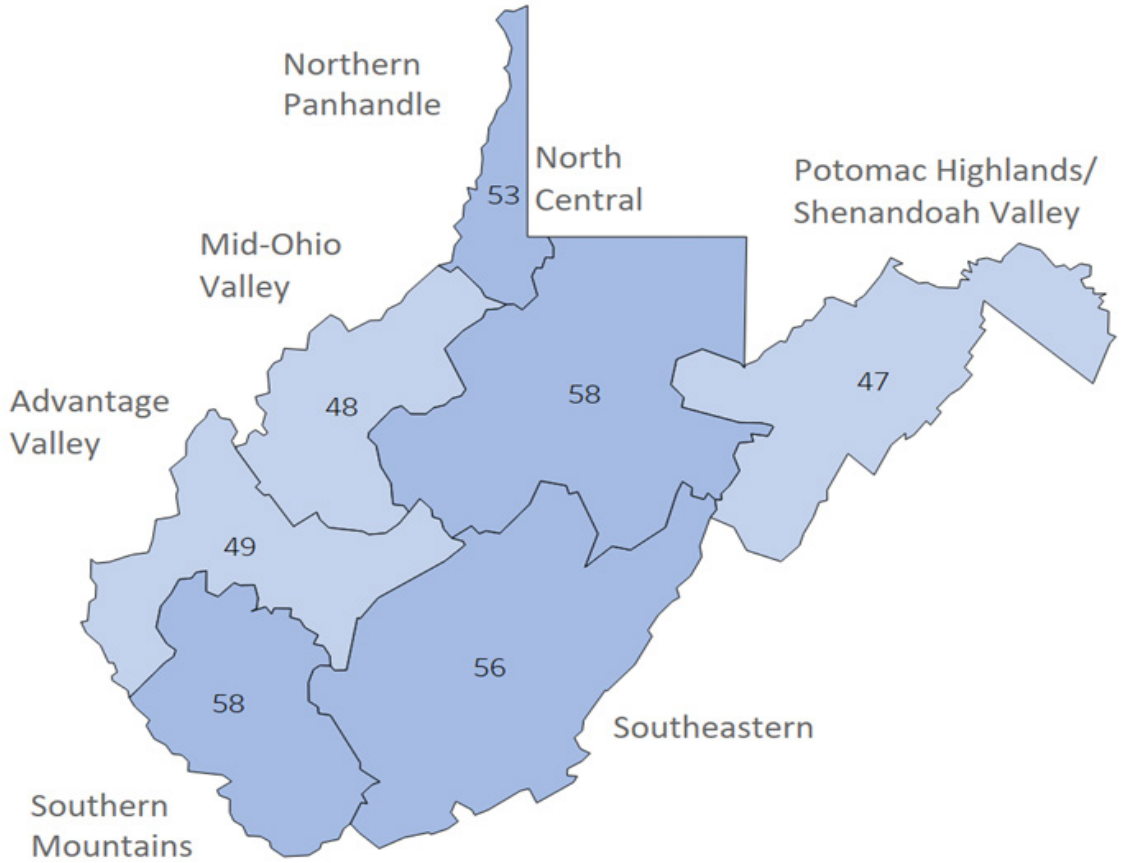
Percentage of regional high-demand employment openings served by at least one CTE program in 2016/17



What did we learn?

- On average, **just over half** (53 percent) of the CTE programs available to students in each region **are aligned** to a high-demand study occupation within the region.

Percentage of CTE programs aligned to a high-demand occupation within the region in 2016/17



Implications

This study can:

- Help WVDE and districts make decisions about CTE program offerings to **strengthen the path between high school preparation and meaningful employment** and **improve alignment with regional labor market** needs.
- **Inform students and families** about which programs align to high-demand occupations in their region.
- **Serve as a model** for policymakers and practitioners in other states.

For ideas on how to use labor-market alignment data to improve CTE program offerings, see our recent blog on this topic:

https://ies.ed.gov/ncee/edlabs/regions/appalachia/blogs/blog33_using-labor-market-alignment-data-to-improve-career-and-technical-ed.asp

Career and Technical Education in Oregon: Exploring Who Participates and the Outcomes They Achieve

Amy Arneson
Senior Researcher—Quantitative Methods
REL Northwest at Education Northwest

Full report available at: https://eric.ed.gov/?id=ED607349

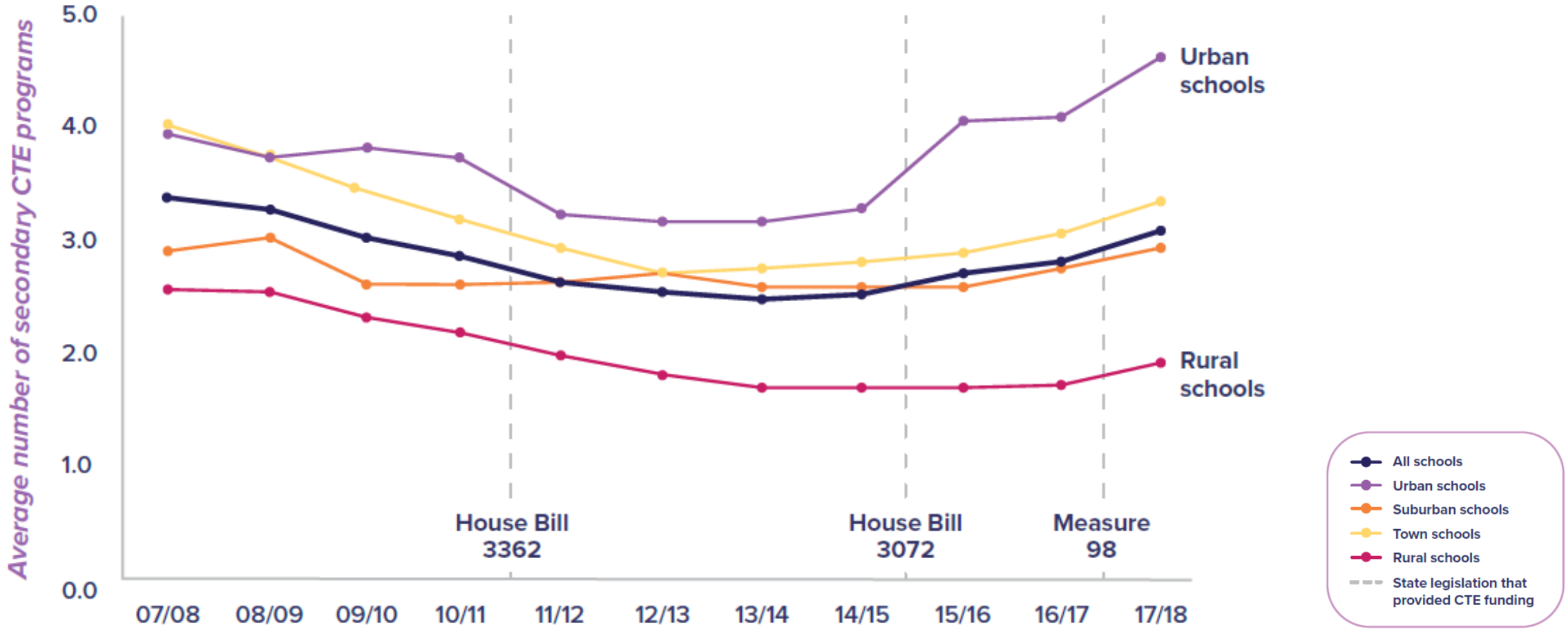
Why this study?

To provide state-level stakeholders with a **retrospective landscape study of CTE** in Oregon to be used a baseline for tracking trends between the *Perkins IV* and *Perkins V* implementation years and to inform the comprehensive local needs assessments that local providers will be developing and submitting every two years.

What did we do?

- Conducted a landscape study of CTE in Oregon covering the *Perkins IV* years (2007/08 through 2017/18).
- Organized findings into three main areas:
  - Secondary CTE program offerings.
  - High school participation in CTE.
  - Academic and workforce outcomes of secondary CTE concentrators.

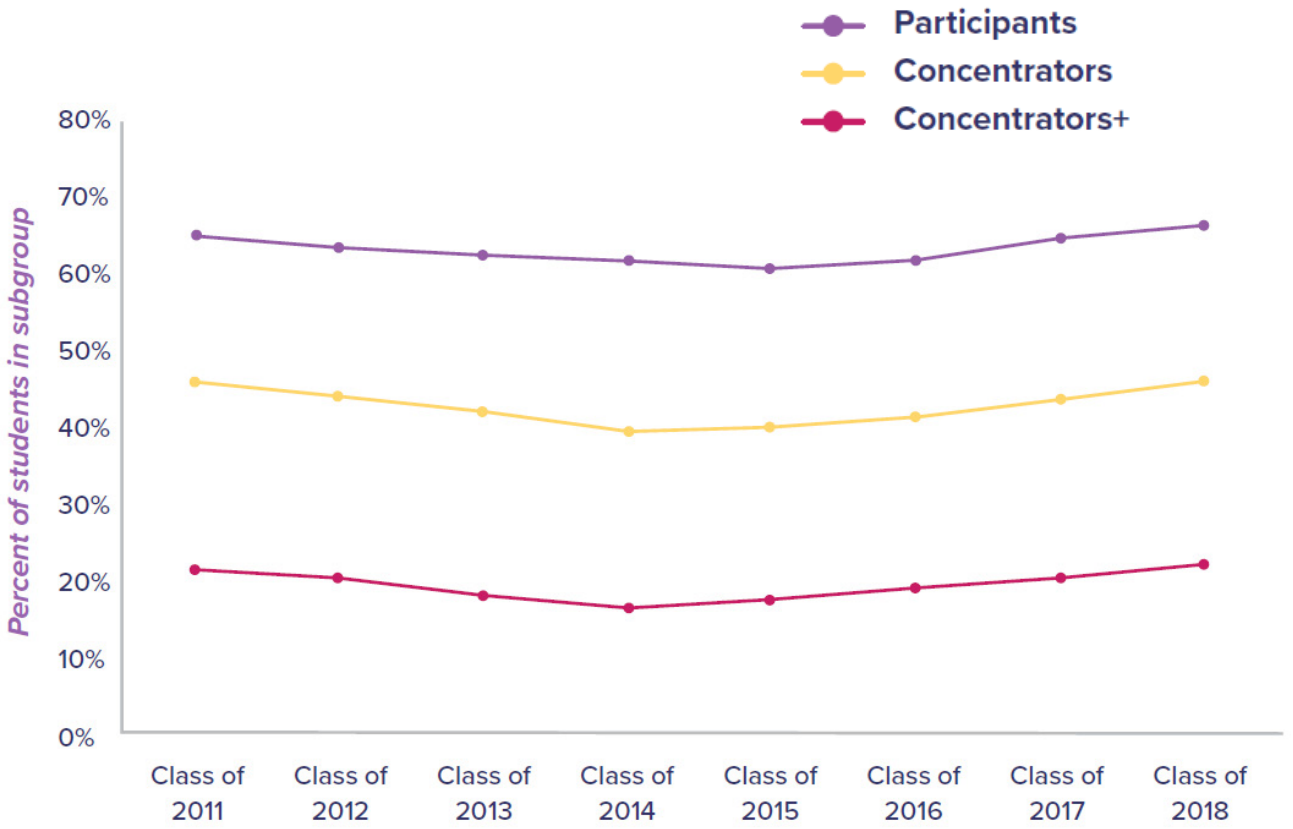
What did we learn about program offerings?



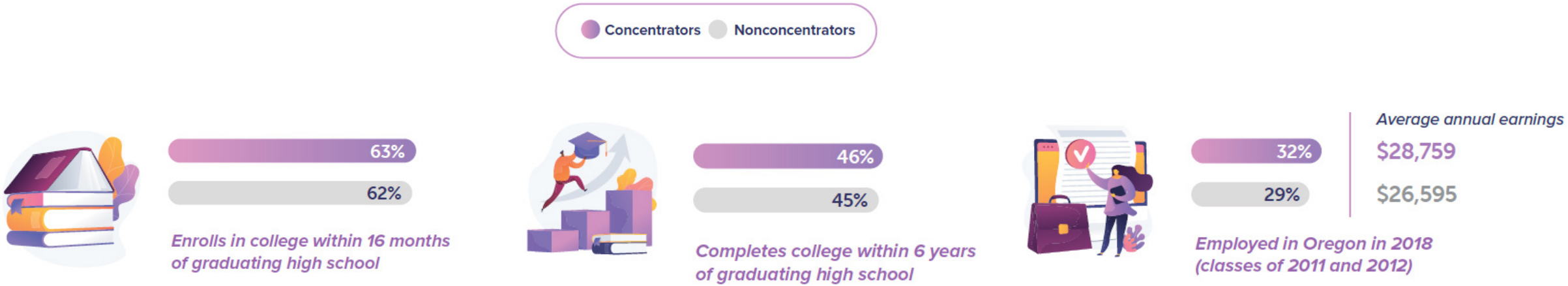
What did we learn about student participation?

High school students were classified into four participation levels, based on the number of CTE credits earned *in a single program/program of study.*

- **Nonparticipants** : fewer than 0.5 CTE credits
- **Participants** : 0.5 or more CTE credits
- **Concentrators** : 1.0 or more CTE credits (Note: *Perkins IV* concentrator)
- **Concentrators+** : 2.0 or more CTE credits (Note: *Perkins V* concentrator)



What did we learn about student outcomes?



Among high school graduates, students who concentrated in CTE in high school were just as likely as those who did not to enroll in college.

Among college enrollees, students who concentrated in CTE in high school were just as likely to complete college as those who did not.

Among all students in the classes of 2011 and 2012, students who concentrated in CTE in high school were moderately more likely to be employed in Oregon 6–7 years after high school and had moderately higher annual earnings.

Implications for policy and practice in Oregon

- Consider policies that help **rural, small, and low-income high schools** offer a minimum threshold of CTE programs.
- Consider strategies for expanding student participation and retention in CTE programming, **given the differential rates of concentration overall and within different program areas**, especially by student gender.
- Historical **stigma** that college was less of an option for CTE (or "vocational") students is not supported by evidence, as CTE concentrators have similar college-going and completion rates as nonconcentrators.

Implications for policy and practice in Oregon

Other findings from the study (not covered in the previous slides) also led to the following implications:

- As concentrators+ are demographically similar to concentrators, Oregon can use the information about equity gaps learned under *Perkins IV* **as they transition into the *Perkins V*** era to drive policy and supports for CTE providers.
- The study uncovered differences in student outcomes by career area, **with concentrating in the health sciences related to the most positive outcomes**. More research is needed to understand **what drives these differences** so that CTE programs in all areas contribute to positive outcomes for students.

Examining High School Career and Technical Education Programs and the Postsecondary Outcomes of Career and Technical Education Students in the Round Rock Independent School District

Lynn Mellor
Deputy Director
REL Southwest at American Institutes for Research

Full report available at: https://ies.ed.gov/ncee/edlabs/projects/project.asp?projectID=6700

Why this study?

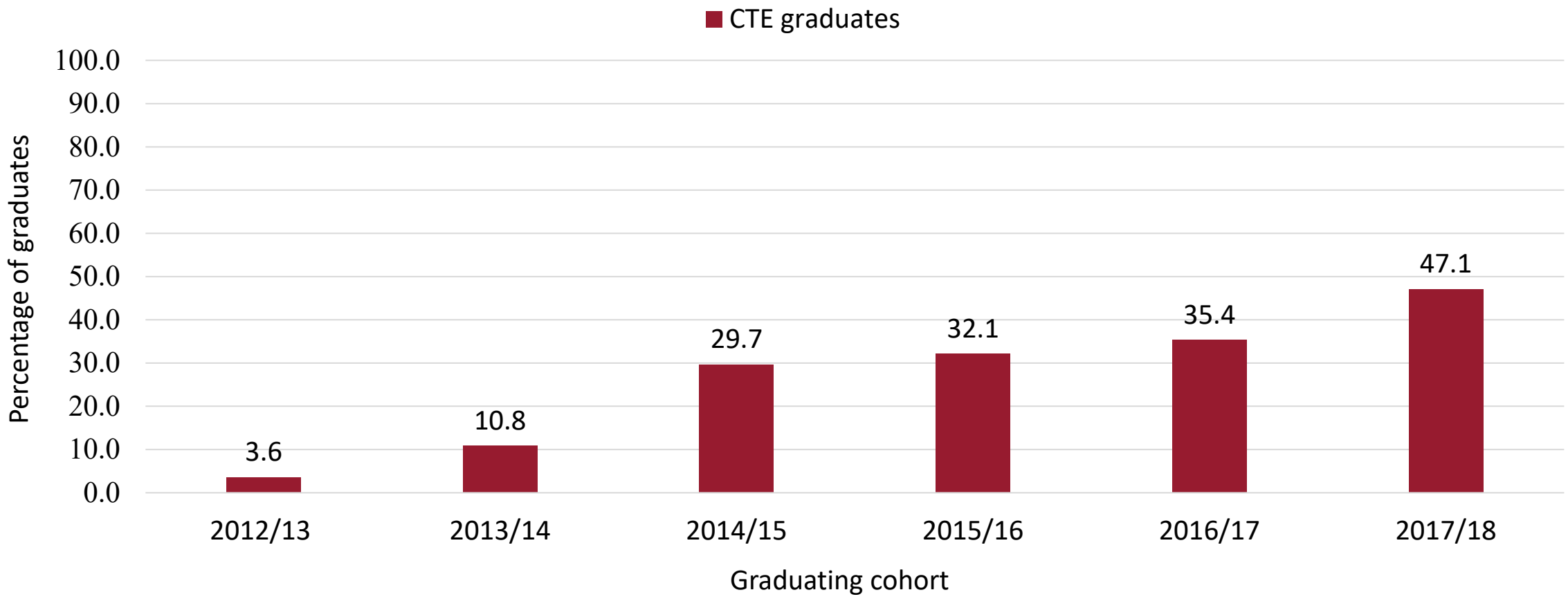
- A study of the Central Texas labor market analyzed the academic preparation of career and technical education (CTE) students to see whether they could step into and succeed in high-wage, in-demand career pathways in the region. Informed by the results of this study, **Round Rock Independent School District (ISD) leaders wanted to make recommendations to the district school board for enhancing CTE programming in the district.**

- Recommendations considered include the possibility of opening a CTE high school that would allow the district to offer additional programs of study, offering specialty courses not currently available within district CTE programs, and funding for state-of-the-art equipment that would be difficult to replicate across all high schools in the district.

What did we do?

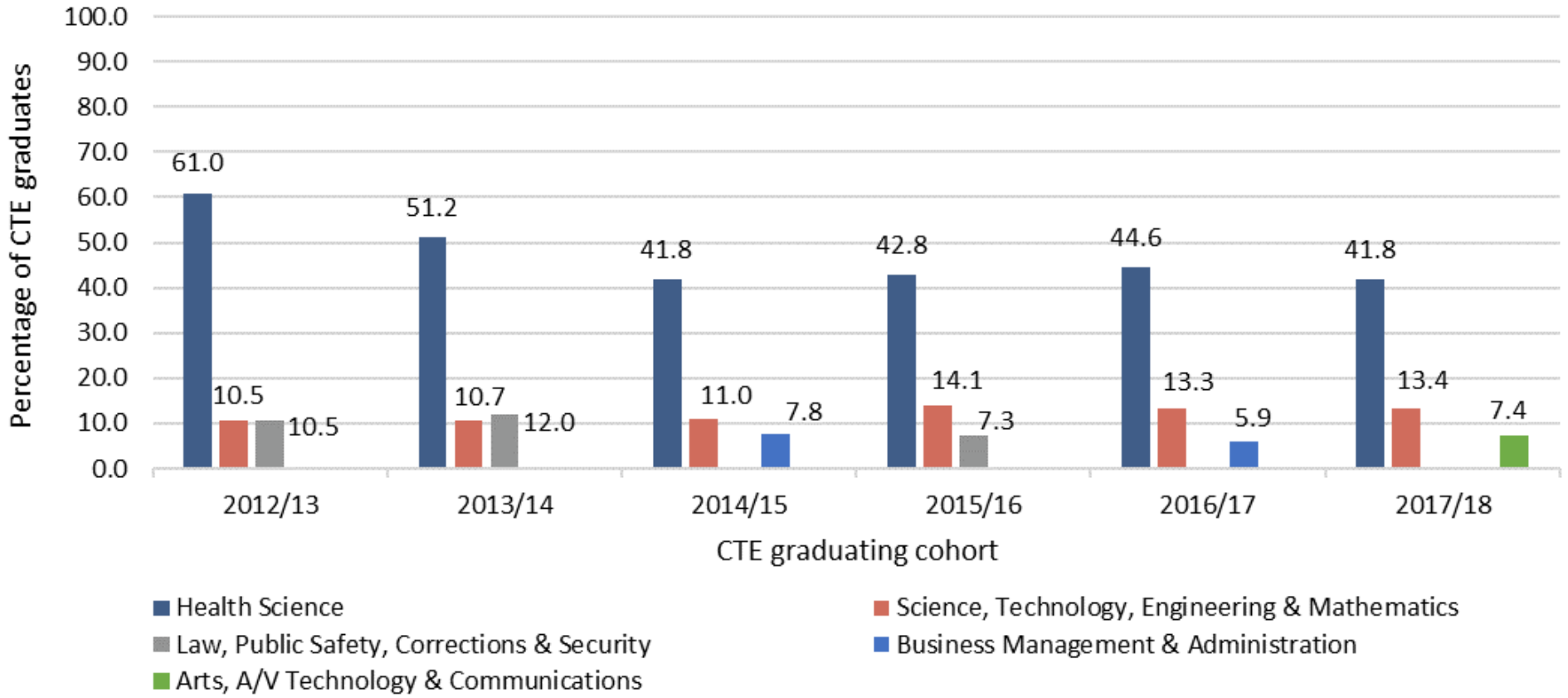
- Examined the alignment of high school CTE programs of study in Round Rock ISD and other Central Texas districts with high-wage, in-demand career pathways in the region.
- Described CTE participation and postsecondary outcomes for Round Rock ISD graduates.

What did we learn?



Almost half of all 2017/18 Round Rock ISD graduates completed one or more CTE programs of study.

What did we learn?

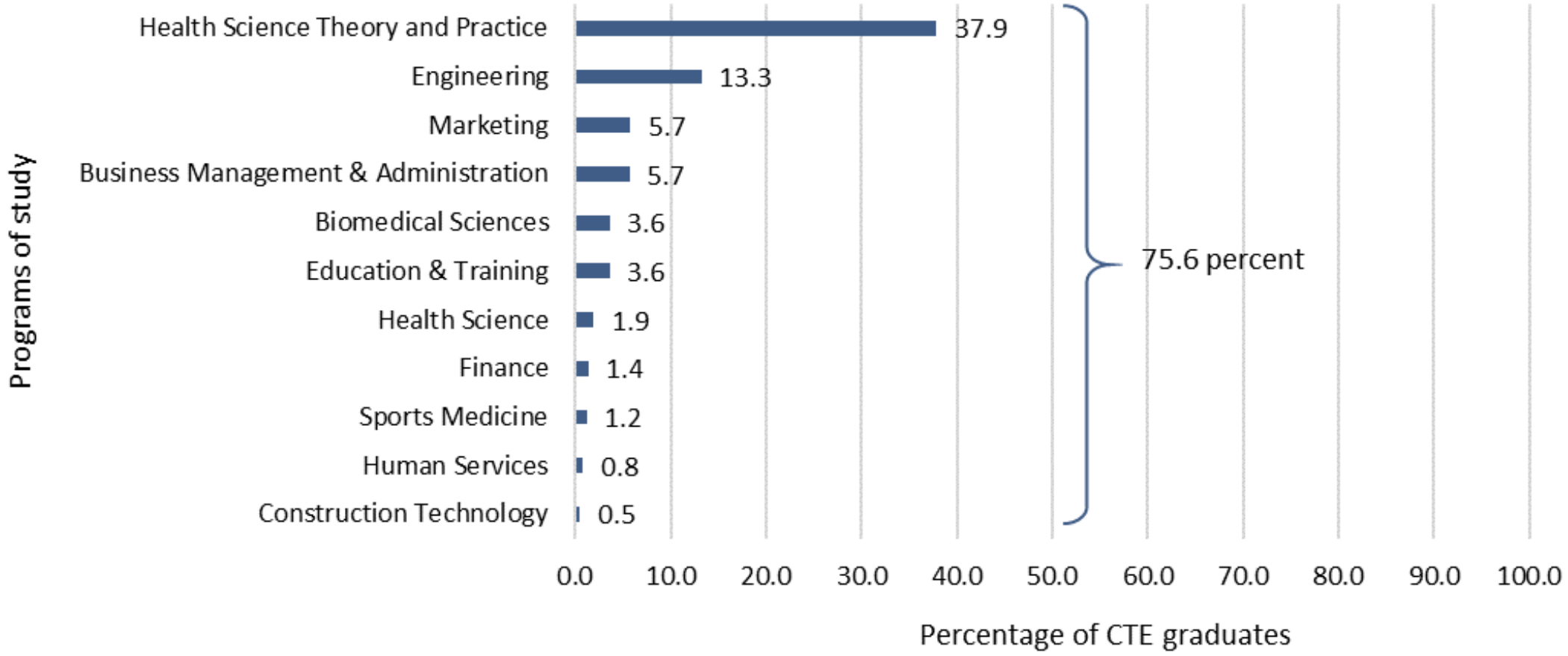


Health Science plus Science, Technology, Engineering & Mathematics were consistently in the top three career clusters that CTE graduates completed.

What did we learn?

Thirteen career pathways were identified as high-wage, in-demand career pathways in Central Texas.

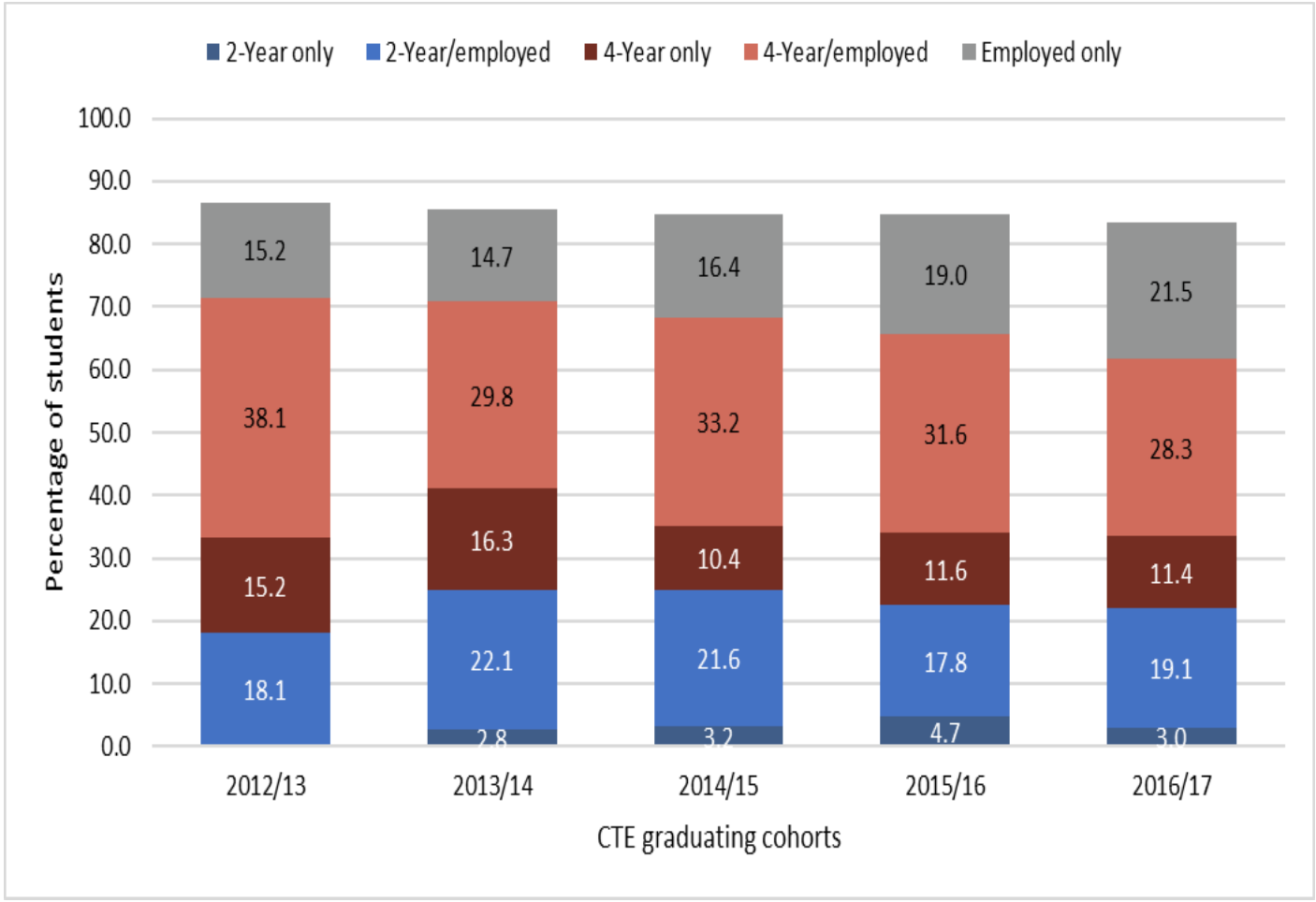
What did we learn?



Seventy-six percent of Round Rock ISD CTE graduates had completed programs of study aligned with high-wage, in-demand career pathways.

What did we learn?

- More than 80 percent of Round Rock CTE graduates in each year examined were either employed or enrolled in college within one year of high school graduation.
- The percentage of Round Rock ISD CTE graduates directly entering the workforce—without also enrolling in college—increased for the last five cohorts.



Implications

- Leaders in Round Rock ISD and other districts in Central Texas could use the results from this study in the following ways:
  - Refine the CTE programs of study that they offer.
  - Improve efficiencies and repurpose resources from less popular, unaligned programs of study to more popular, aligned programs.
  - Demonstrate for students and families which colleges and universities in the region offer credentials in high-wage, in-demand programs of study.
  - Promote to students and families the benefits of earning industry-based certifications in high-wage, in-demand career pathways, which can further support students in transitioning to the workforce.

Implications (continued)

  - Work with community colleges to align more of the high-wage, in-demand programs of study to their articulated credit programs or offer more dual-credit CTE courses in those programs to encourage postsecondary enrollment and completion.
  - Partner with local organizations to offer work-based learning opportunities for students in high-wage, in-demand career pathways.
  - Consider expanding CTE in its high schools or to a new high school that would allow districts to offer specialty courses and programs of study not currently offered but are aligned to high-wage, in-demand career pathways.
- Other states and districts could apply similar techniques used in this study with their labor market statistics and programs of study to better understand workforce alignment in their region.

Breakout Sessions

Breakout group discussion questions

- What findings stood out to you and why?
- Have you considered or would you consider conducting a similar study in your region?
- How would you use the results of a study like this?
- Do you have the data to conduct a study similar to this study?
- What other related analyses would be beneficial?

Share-Out and Wrap-up

Thank you!

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Supplementary Slides for REL Appalachia Breakout Group

Regional summaries – example from the Mid-Ohio Valley region

Number of projected employment openings (2014–24)	Occupation	Aligned high school CTE programs	Number of schools with aligned CTE programs
2,408	Office clerks, general	Information management[a]	8
		Management and administrative support[a]	7
1,016	Secretaries and administrative assistants, except legal, medical	Information management[a]	8
		Management and administrative support[a]	7
920	Maintenance and repair workers	None	na
848	Nursing assistants	Therapeutic services	3
823	Bookkeeping, accounting, and auditing clerks	Accounting	4
603	Automotive service technicians and mechanics	Automotive technology	3
552	Electricians	Electrical technician	2
		Power, structural and technical systems[a]	4
454	Cooks, restaurant	Pro-Start restaurant management[a]	2
340	First-line supervisors of construction trades and extraction	Energy, power and engineered systems	1
301	Security guards	Law and public safety[a]	2
272	Carpenters	Carpentry	4
		Power, structural and technical systems[a]	4
260	Industrial machinery mechanics	None	na
260	Welders, cutters, solderers, and brazers	Agribusiness systems	7
		Power, structural and technical systems[a]	4
		Welding	4
251	Police and sheriff's patrol officers	Law and public safety[a]	2
221	Pharmacy technicians	Allied Health	1
210	Food service managers	Pro-Start restaurant management[a]	2
		Careers in education	3
208	Teacher assistants	Early childhood education	2
207	Wellhead pumpers	Chemical energy and mechanical technologies	1
155	Tire repairers and changers	Automotive technology	3
141	Heating, air conditioning, and refrigeration mechanics I	None	na

Regional summaries continued – example from the Mid Ohio Valley region

Unaligned high school CTE programs	Number of schools with CTE program	Between region alignment	National alignment
Aesthetics	1	No	No
Animal processing	1	No	No
Animal systems	3	No	Yes
Broadcasting technology	1	No	No
Career and work skills training	3	No	No
Coding, app and game design	1	No	Yes
Collision repair technology	2	No	No
Computer systems repair technology	3	No	No
Diesel equipment technology	1	No	No
Drafting	3	No	No
Emergency/firefighting management services	1	No	No
Food science and nutrition	4	No	No
Forest industry	1	No	No
Hairstylist	1	Yes	Yes
JROTC	3	No	No
Medical office	2	No	No
Microsoft computer applications specialist	1	No	No
Millwork and cabinetmaking	2	No	No
Nail technology	1	Yes	Yes
Natural resources management	1	No	Yes
Performing arts	3	No	No
Personal fitness and wellness training	1	Yes	Yes
Plant systems	6	No	No
Prevention support specialist	1	No	No
Robotics	1	No	No
Simulation and game development virtual	3	No	No
STEM	4	No	No
Turf and landscape systems	1	No	No
Visual arts	3	No	No

What did we learn?

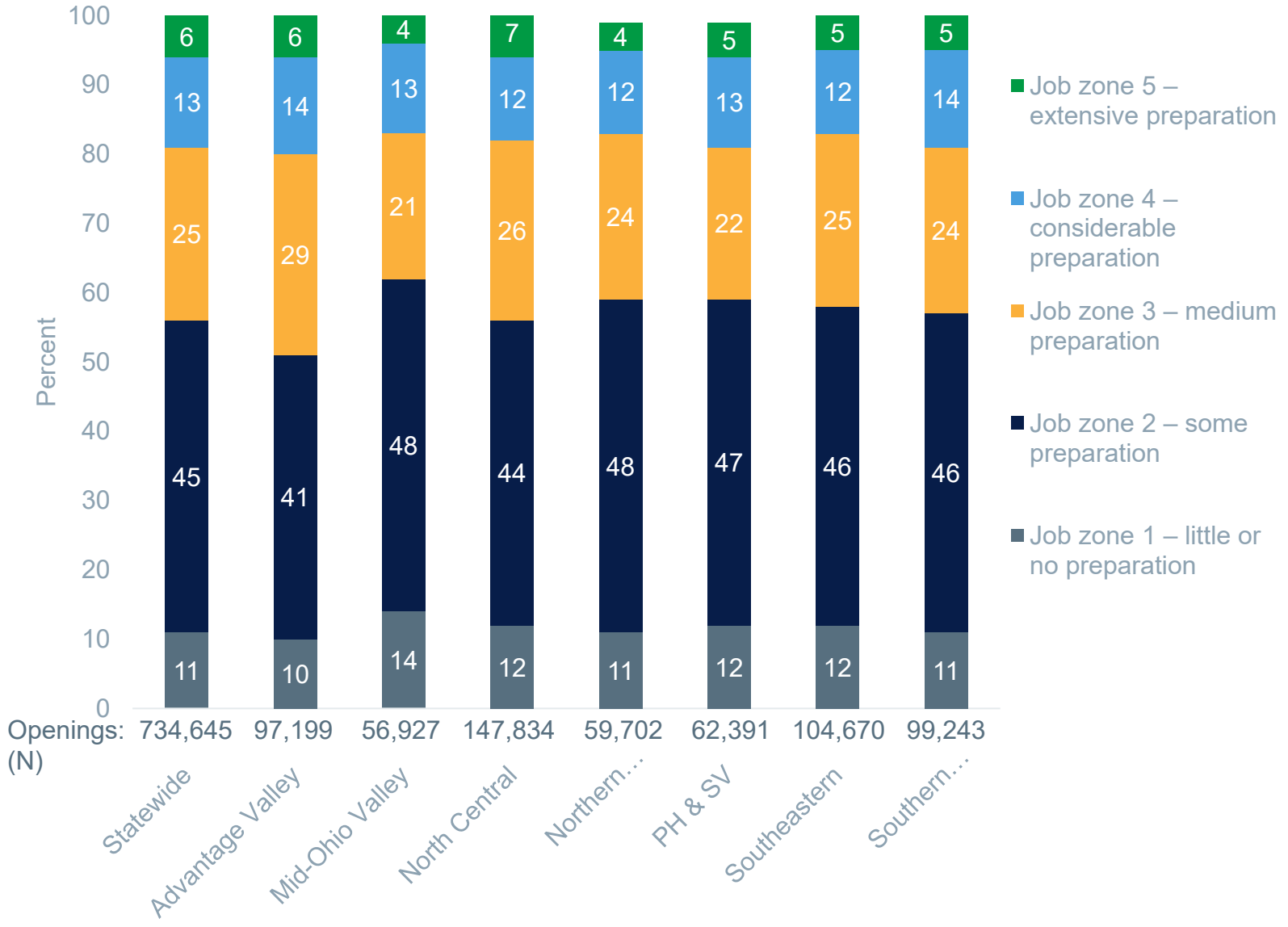
- There were **11 high-demand study occupations** that **did not have an aligned CTE program** within the region.
- **Five of these 11** high-demand study occupations were **unserved in more than one region.**

Unserved high-demand study occupations (number of regions without an aligned CTE program in parentheses):

- Maintenance and repair workers (3)
- First-line supervisors of construction trades and extraction (2)
- Hairdressers, hairstylists, and cosmetologists (2)
- Industrial machinery mechanics (2)
- Paralegals and legal assistants (2)
- Court, municipal, and license clerks (1)
- Fitness trainers and aerobics instructors (1)
- Heating, air conditioning, and refrigeration mechanics and installation (1)
- Pharmacy technicians (1)
- Police and sheriff's patrol officers (1)
- Security guards (1)

What did we learn?

- Statewide, **70 percent** of projected employment openings **require moderate levels of vocational preparation** (job zones 2 and 3), while only **19 percent require a bachelor's degree or more** (job zones 4 and 5).



Limitations

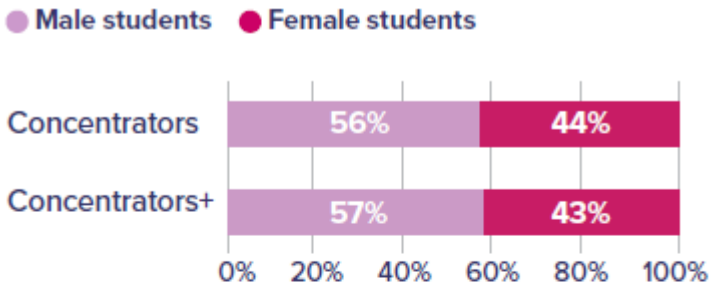
- **Unaligned CTE programs may be aligned** to high-demand occupations that were excluded from the study or to high-demand occupations in neighboring states.
- **Data limitations**
  - Had limited data on alignment between CTE programs and occupations that require a bachelor's degree or more.
  - Lacked data on alignment between high school CTE programs and postsecondary CTE offerings.
  - Could not examine the alignment of credentials (for example, licenses and certificates) with labor market demand.
  - Had to use national data on vocational preparation requirements.

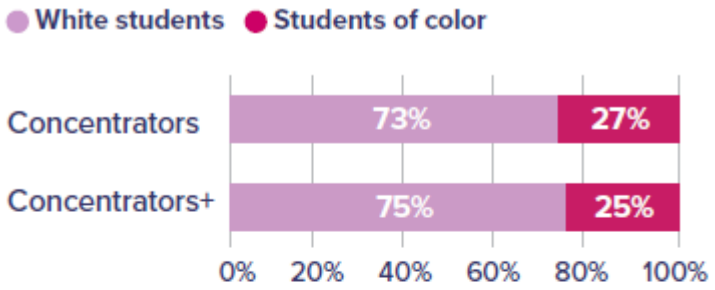
Next steps

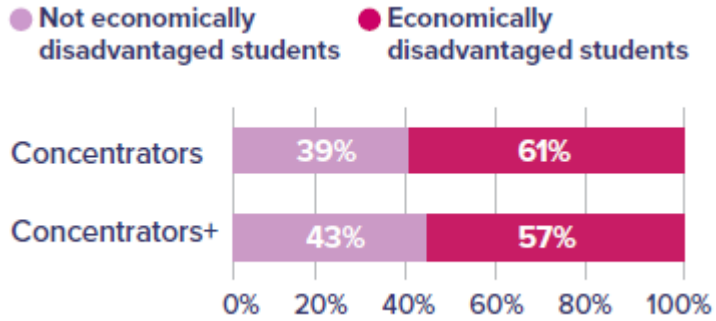
- **This study is a first step** toward quantitatively gauging the alignment between West Virginia's high school career and technical education programs and the labor market.
- **Additional analyses** could improve WVDE's decisionmaking capacity. For example it could be useful to:
  - Examine alignment to high-demand occupations that require a bachelor's degree or more.
  - Examine alignment between high school CTE programs and postsecondary CTE programs.
  - Compare student completion of CTE programs to projected employment openings (supply-demand analysis).
  - Conduct a high-school-level analysis to determine if students in certain schools are lacking appropriate CTE opportunities.

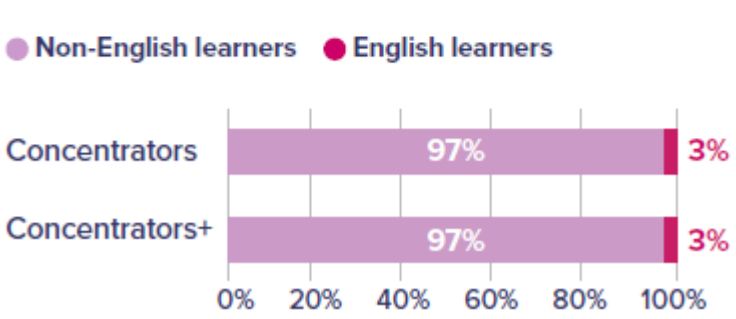
Supplementary Slides for REL Northwest Breakout Group

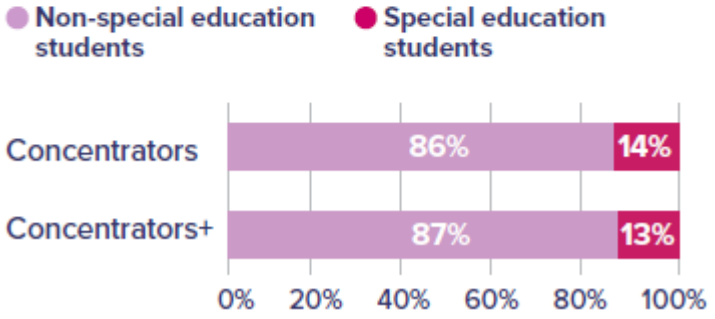
Concentrators (Perkins IV) and Concentrators+ (Perkins V)



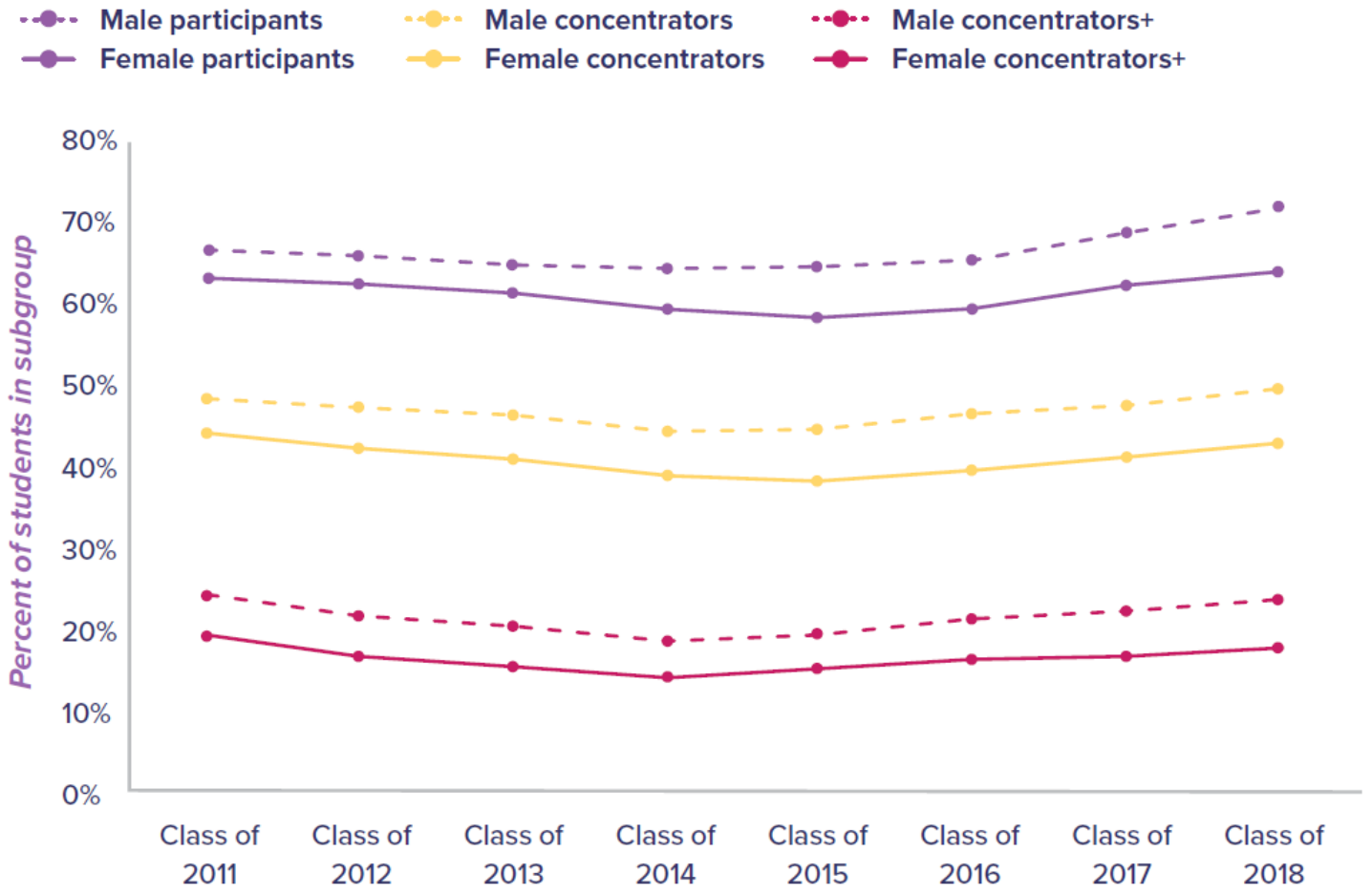




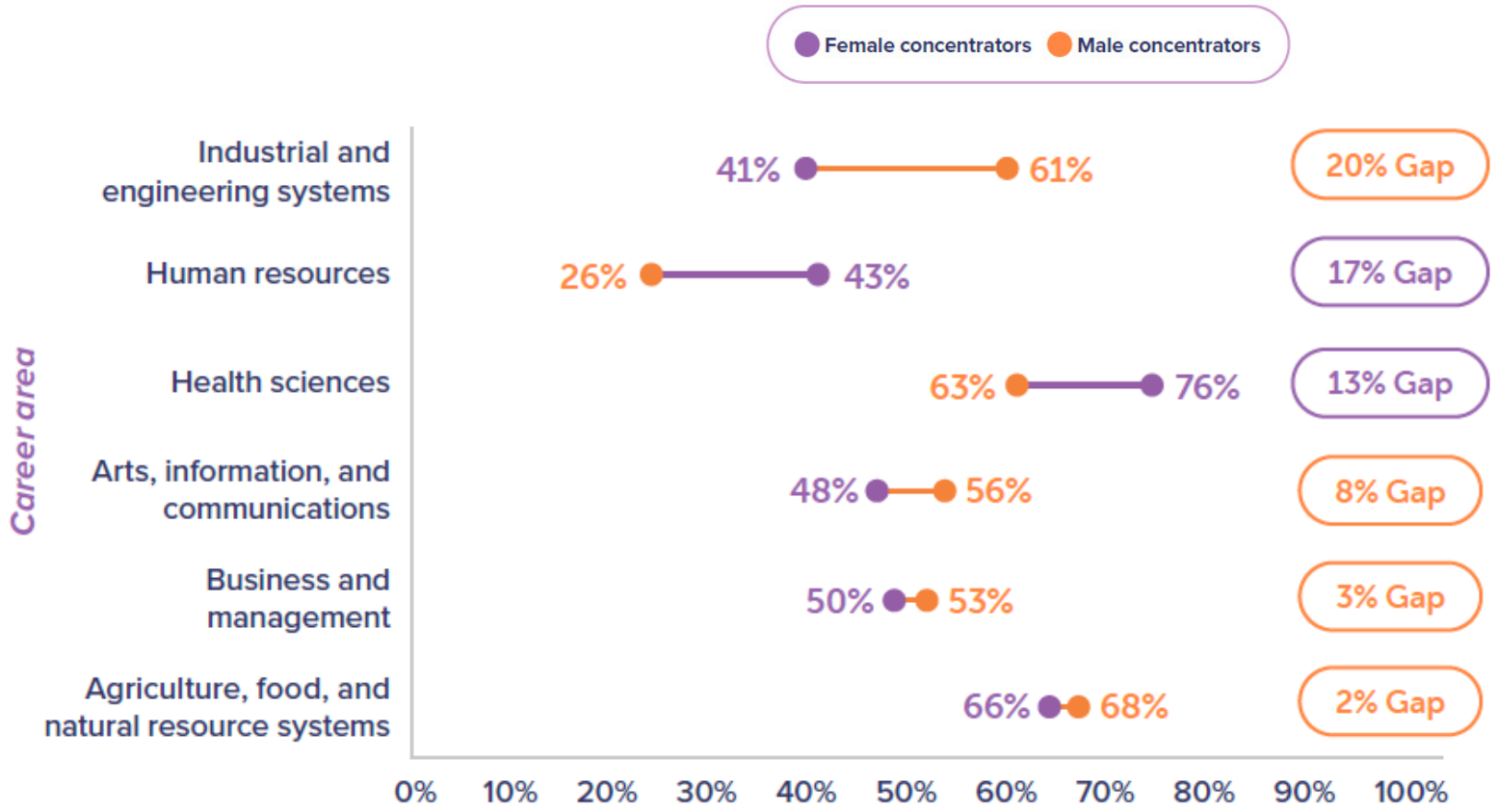




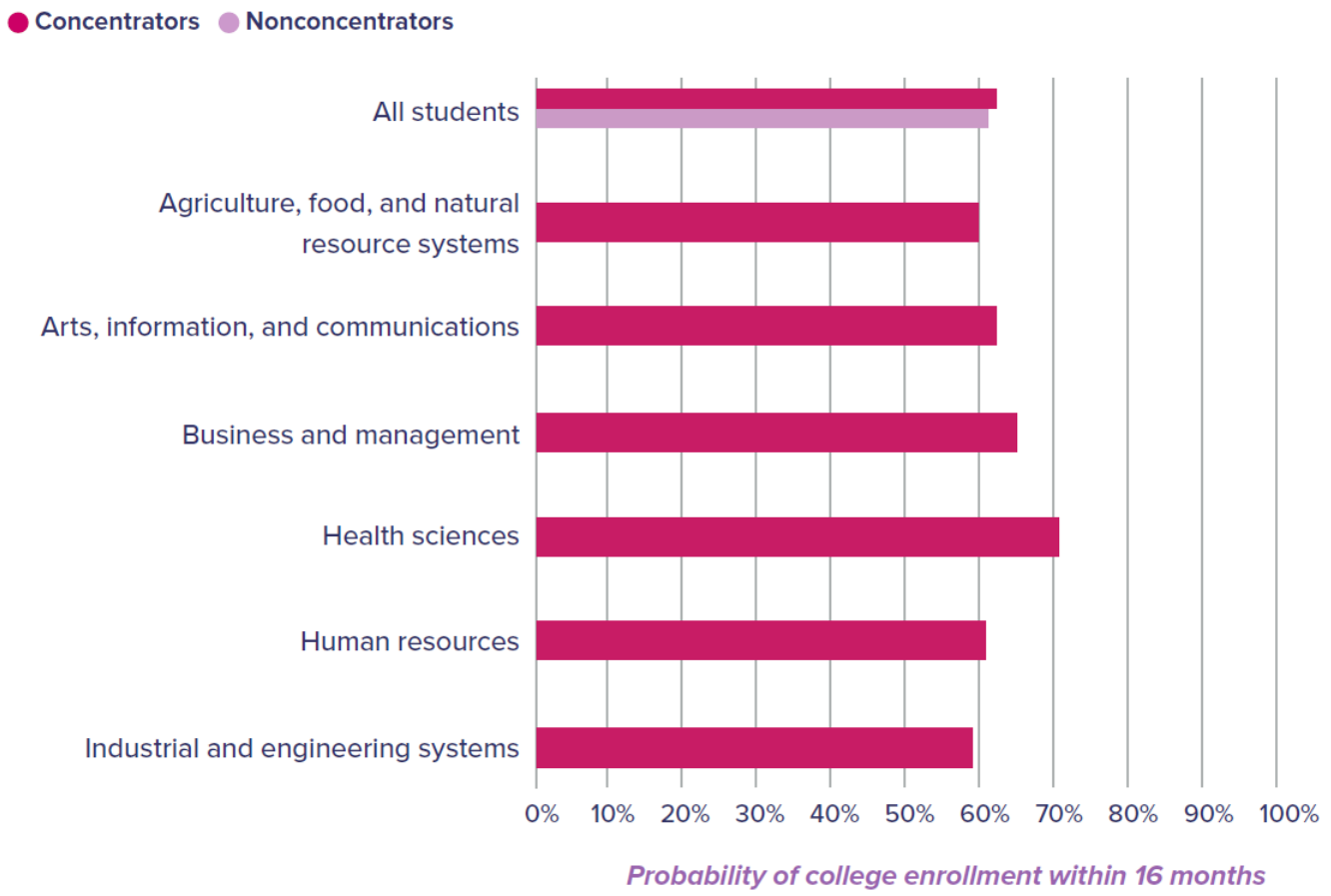
Student participation by gender



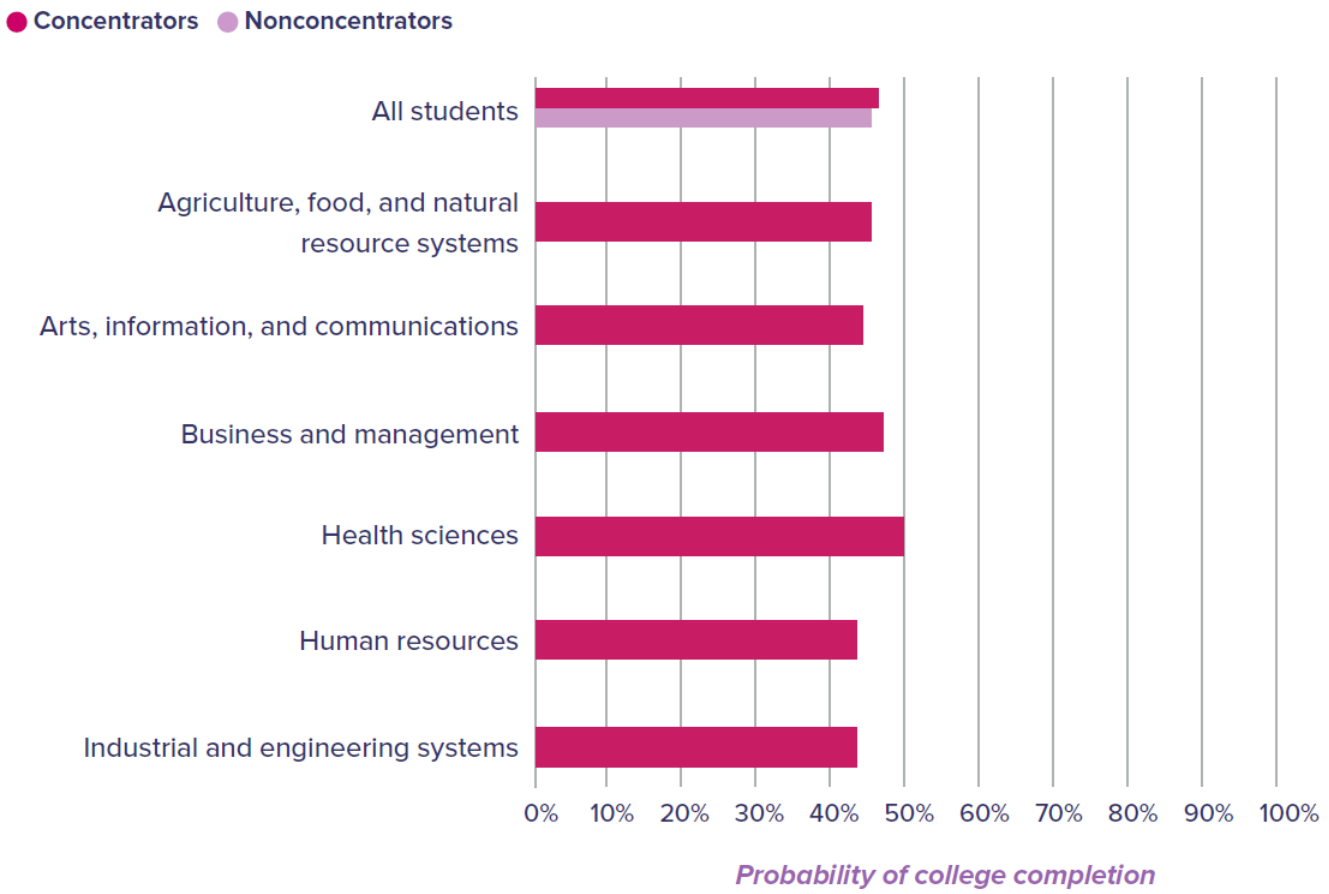
Student persistence by gender



College enrollment by career area of concentration

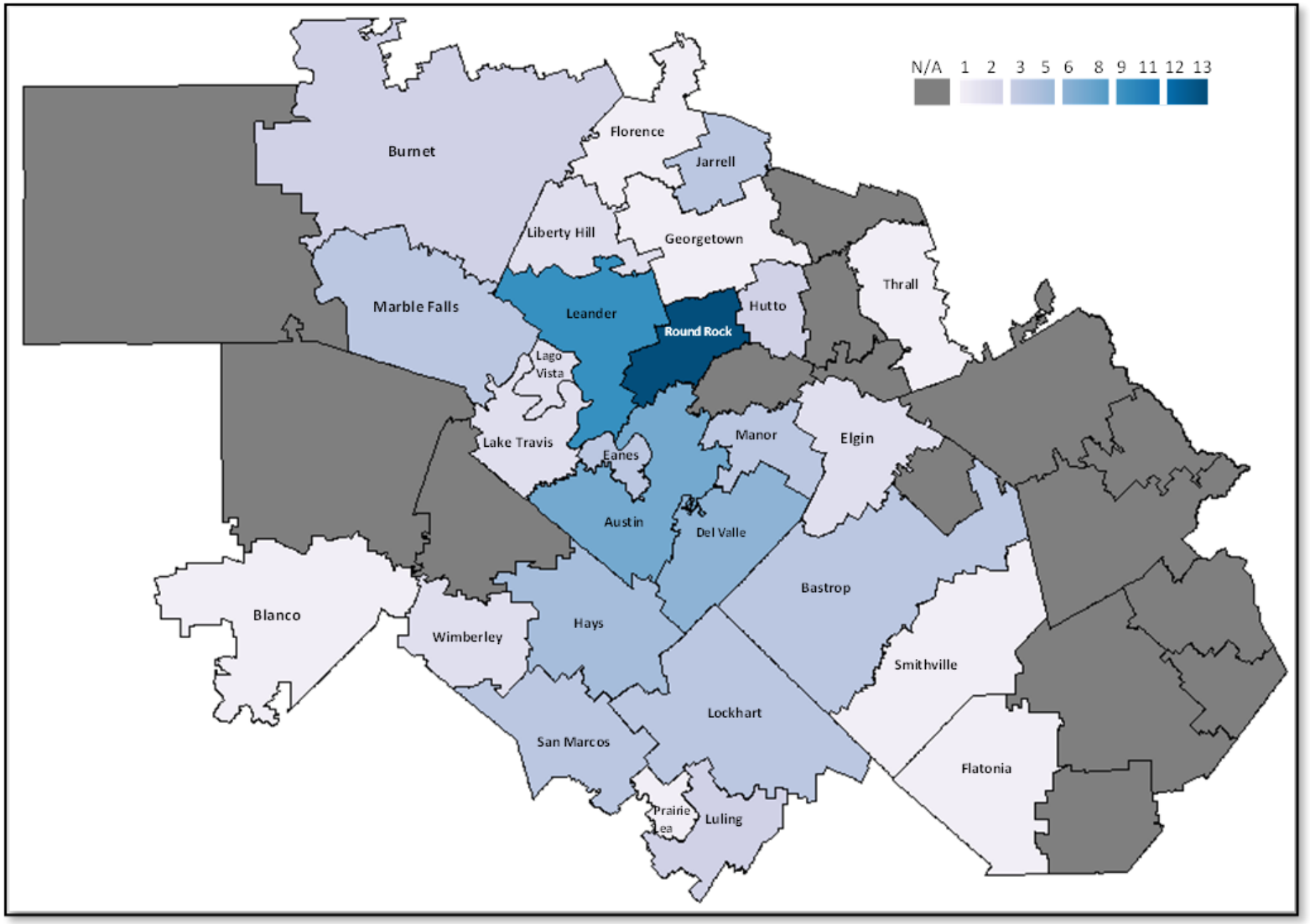


College completion by career area of concentration



Supplementary Slides for REL Southwest Breakout Group

The number of CTE programs of study offered in 2015/16 through 2017/18 that aligned with Central Texas high-wage, in-demand career pathways, by school district



The percentage of 2015/16 through 2017/18 CTE graduates who completed programs of study aligned with Central Texas high-wage, in-demand career pathways, by school district