

The World Needs CTE

**Why Career & Technical
Education Holds the Key to
Our Economic Future**



November 2024



The world needs CTE more than ever.

In this report, you will discover trends in global and domestic job growth that **must be disrupted to build a strong economy.**

You will learn about workforce forecasts across major industries that we must prepare for. Collectively, training the next generation is our responsibility as educators.

You will hear directly from those CTE educators, experts, and administrators regarding the current state of CTE and what we can do to prepare students for the careers of tomorrow.

This research has been conducted by Catapult X, an independent research agency specializing in science, STEM and CTE education, on behalf of iCEV, a comprehensive platform for career & technical education (CTE).

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Global Perspective



Our world is rapidly changing, leading to skills gaps across STEM, agriculture, business, healthcare, manufacturing, and more.

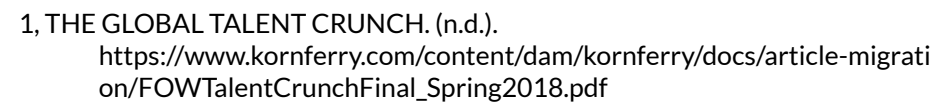
CTE is emerging as our most powerful tool for workforce transformation, but it is not without its challenges.

The future of our economy, especially in the US, depends on career & technical education and on giving educators the tools they need to train the workforce of the future.

The voices of CTE educators are our compass, pointing the way forward.

Dusty Moore
President / CEO
iCEV





The World Needs CTE | 2024

Global Shortfall of 85.2 Million Workers

According to a report by Korn Ferry, a global talent **shortage of 85.2 million** skilled workers is projected across 20 major economies by 2030.

This significant workforce deficit could potentially lead to **\$8.452 trillion** in unrealized annual revenue.

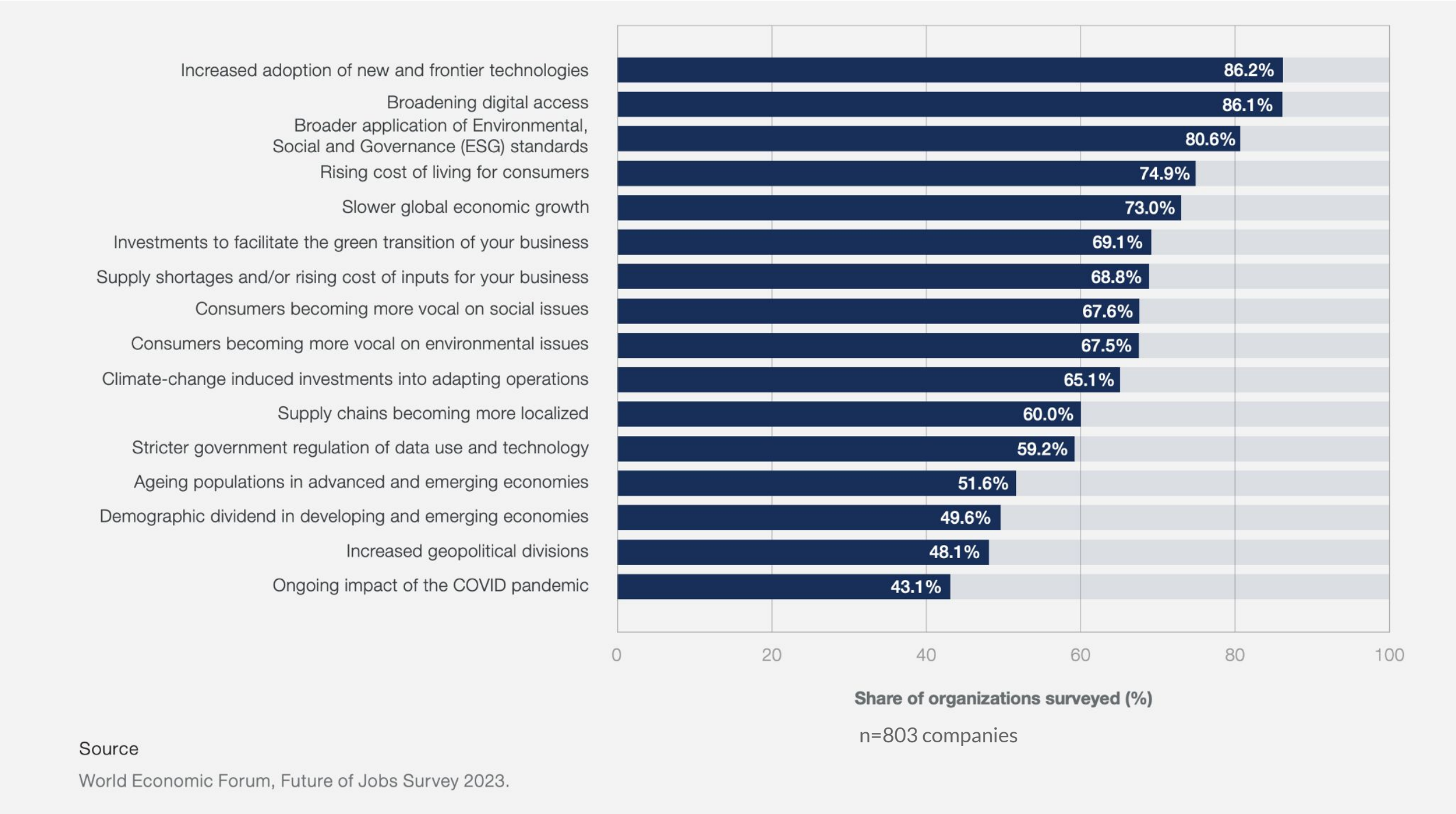
The study highlights the substantial economic impact of the looming talent crunch, emphasizing the urgent need for strategic workforce planning and development on a global scale.



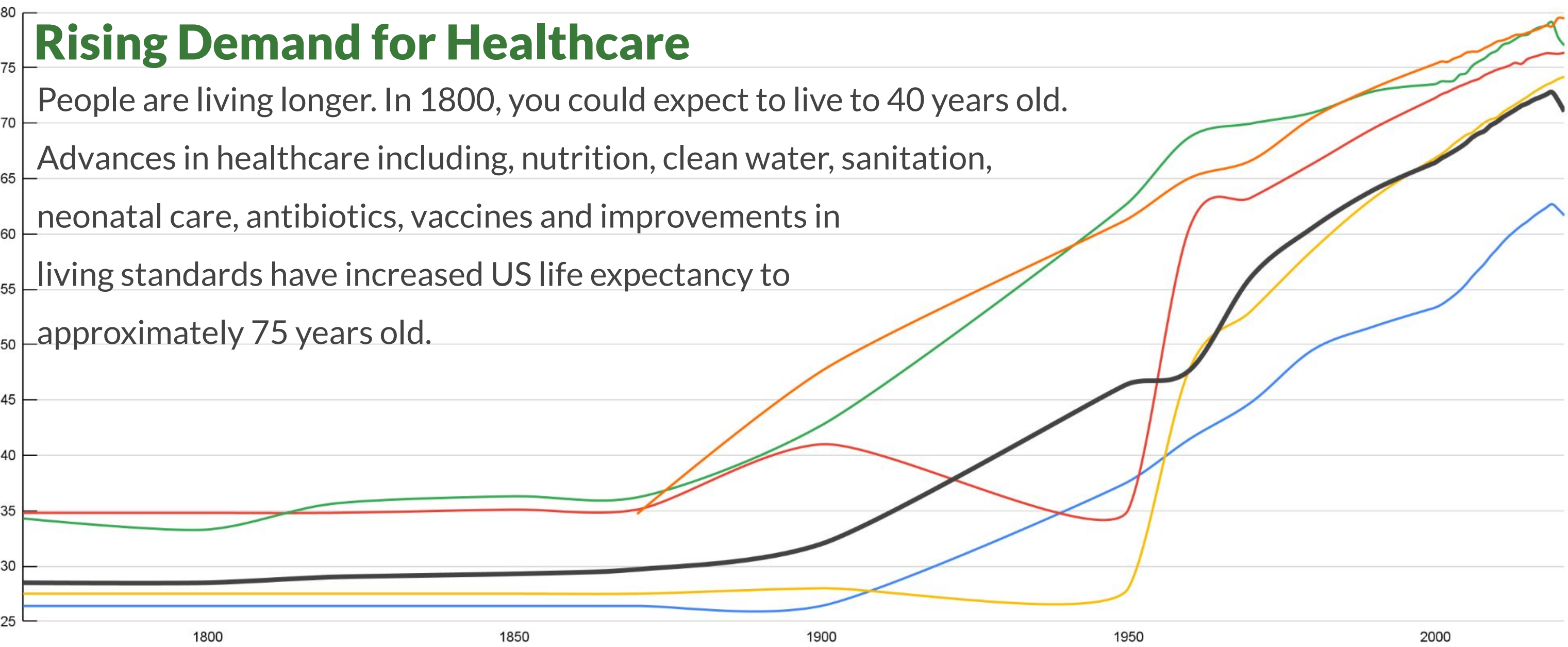
1. THE GLOBAL TALENT CRUNCH. (n.d).
https://www.kornferry.com/content/dam/kornferry/docs/article-migration/FOWTalentCrunchFinal_Spring2018.pdf

Top Global Drivers of Job Growth

- 1 Technology
- 2 Digital Access
- 3 Environmental Regulations
- 4 Rising Cost of Living
- 5 Slower Global Economic Growth



Increased Life Expectancy Drives Healthcare Growth



3. Data source: UN WPP (2022); HMD (2023); Zijdemann et al. (2015); Riley (2005) – Learn more about this data
OurWorldInData.org/life-expectancy |

[Download: Bridging the 10 Million Health Worker Gap](#)

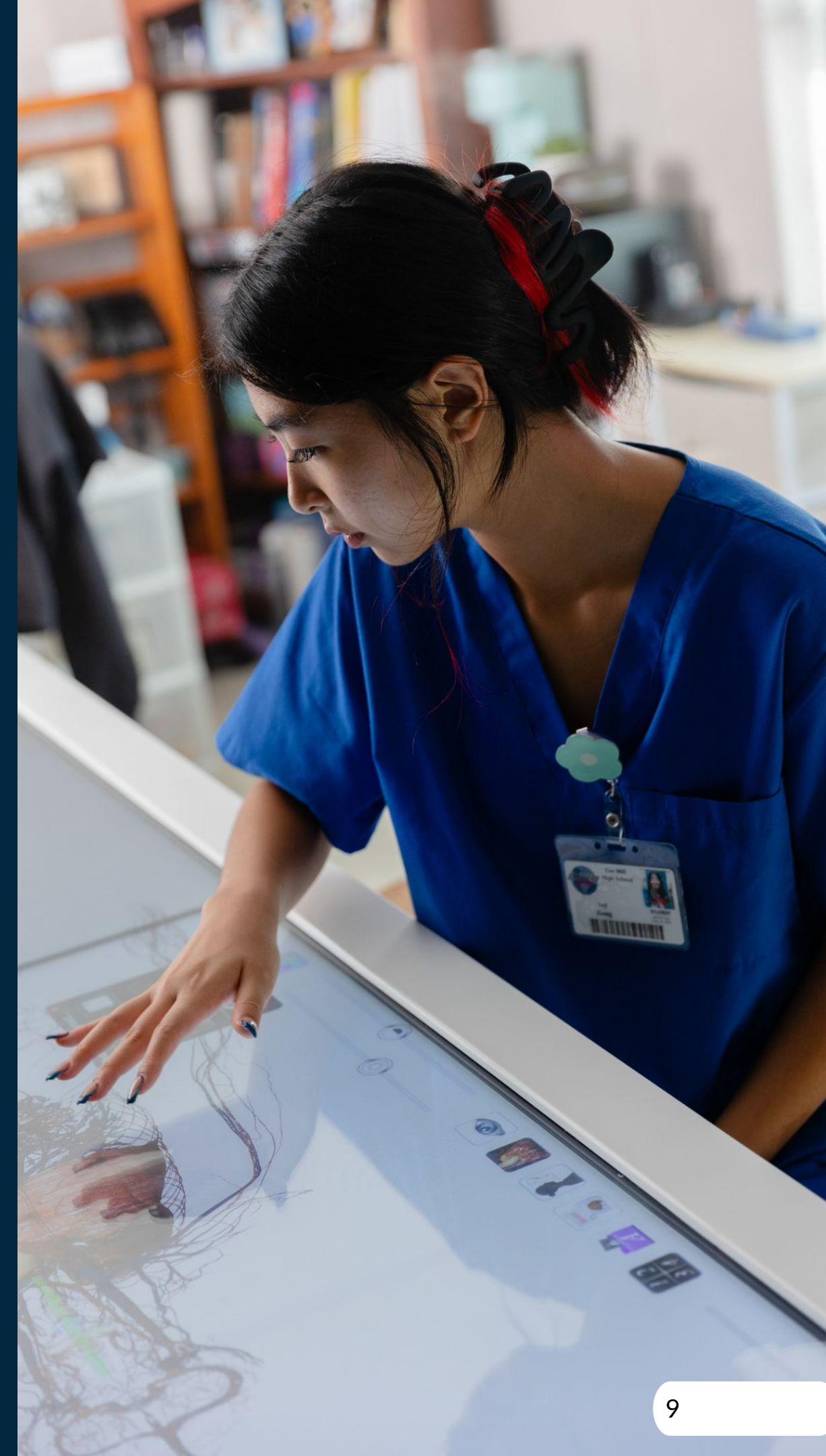
How Does the US Compete?



America's competitive edge in the global economy begins in CTE classrooms. Today's career and technology educators are developing tomorrow's skilled workforce—teaching the essential technical skills and growth mindsets that drive innovation and economic strength.

Our nation's ability to compete and lead in the global marketplace depends on these extraordinary educators and their ability to prepare students for the opportunities ahead.

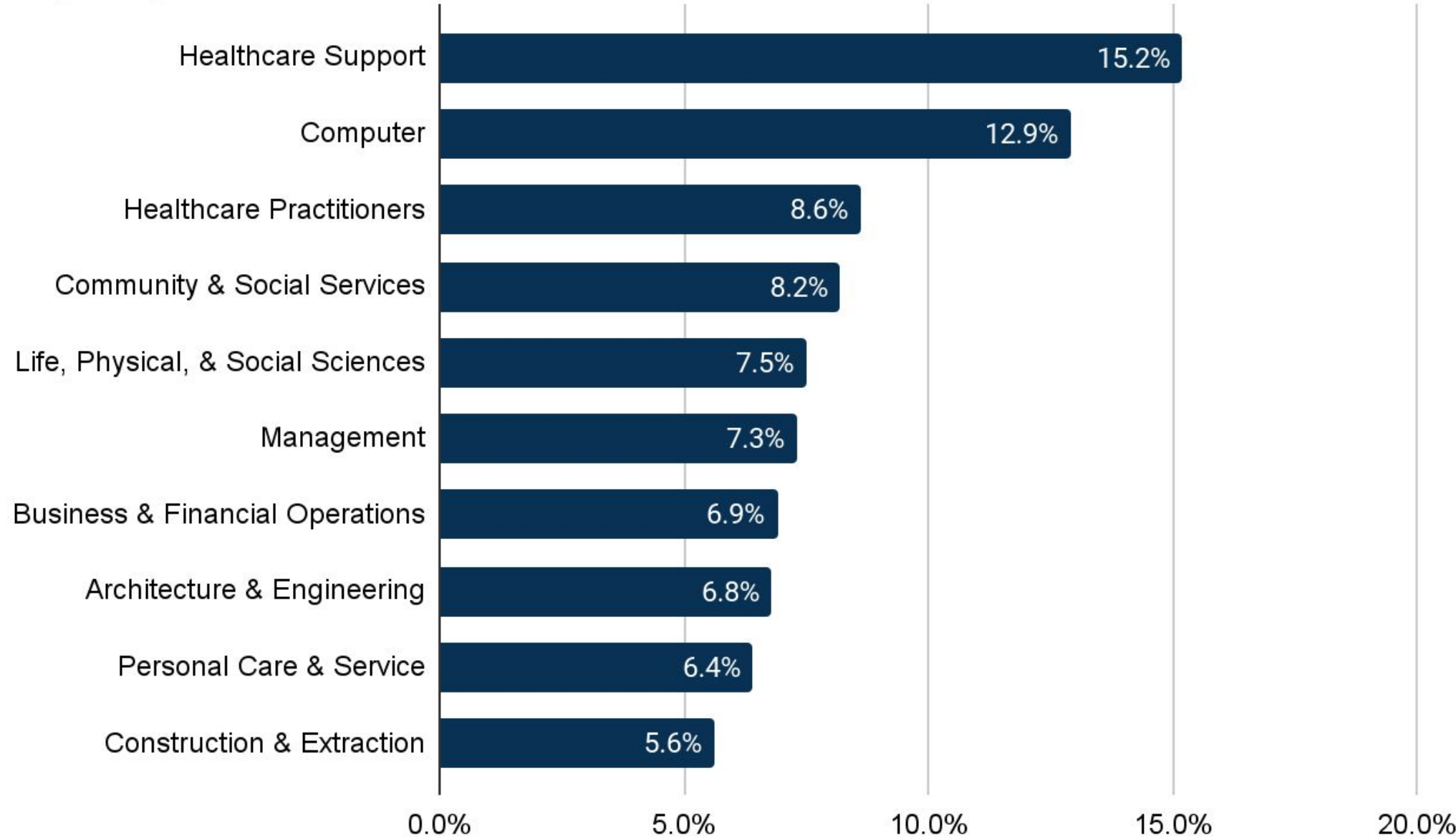
Dusty Moore
President / CEO
iCEV



US Healthcare & Technology Growth

Employment Change by Occupational Group

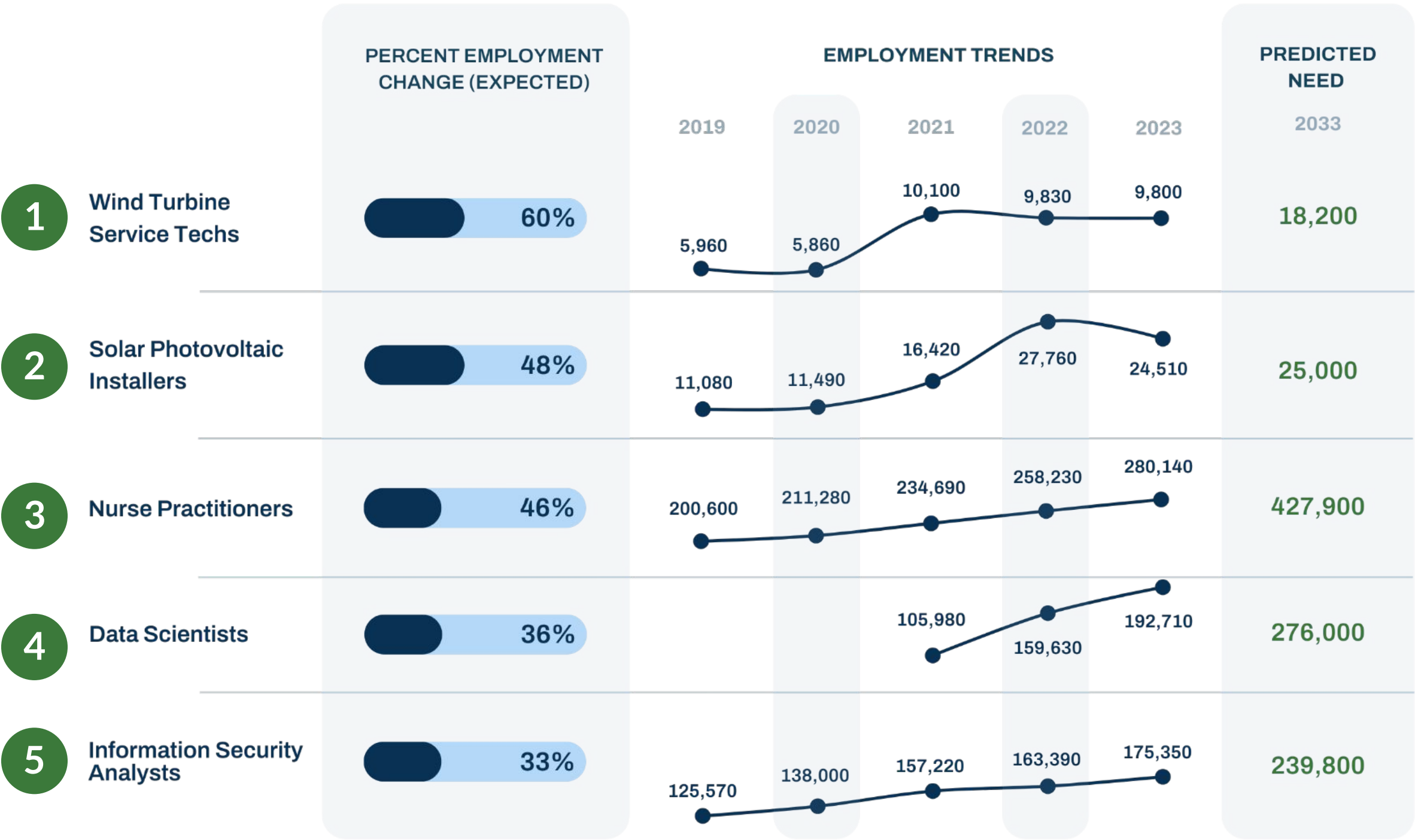
Projected, 2023 - 2033



4. Source: Bureau of Labor & Statistics <https://www.bls.gov/news.release/pdf/ecopro.pdf>



Demand Outpaces Supply in These Top 5 Jobs



The US Bureau of Labor & Statistics projects severe shortages of Nurse Practitioners, Data Scientists and IT Analysts.

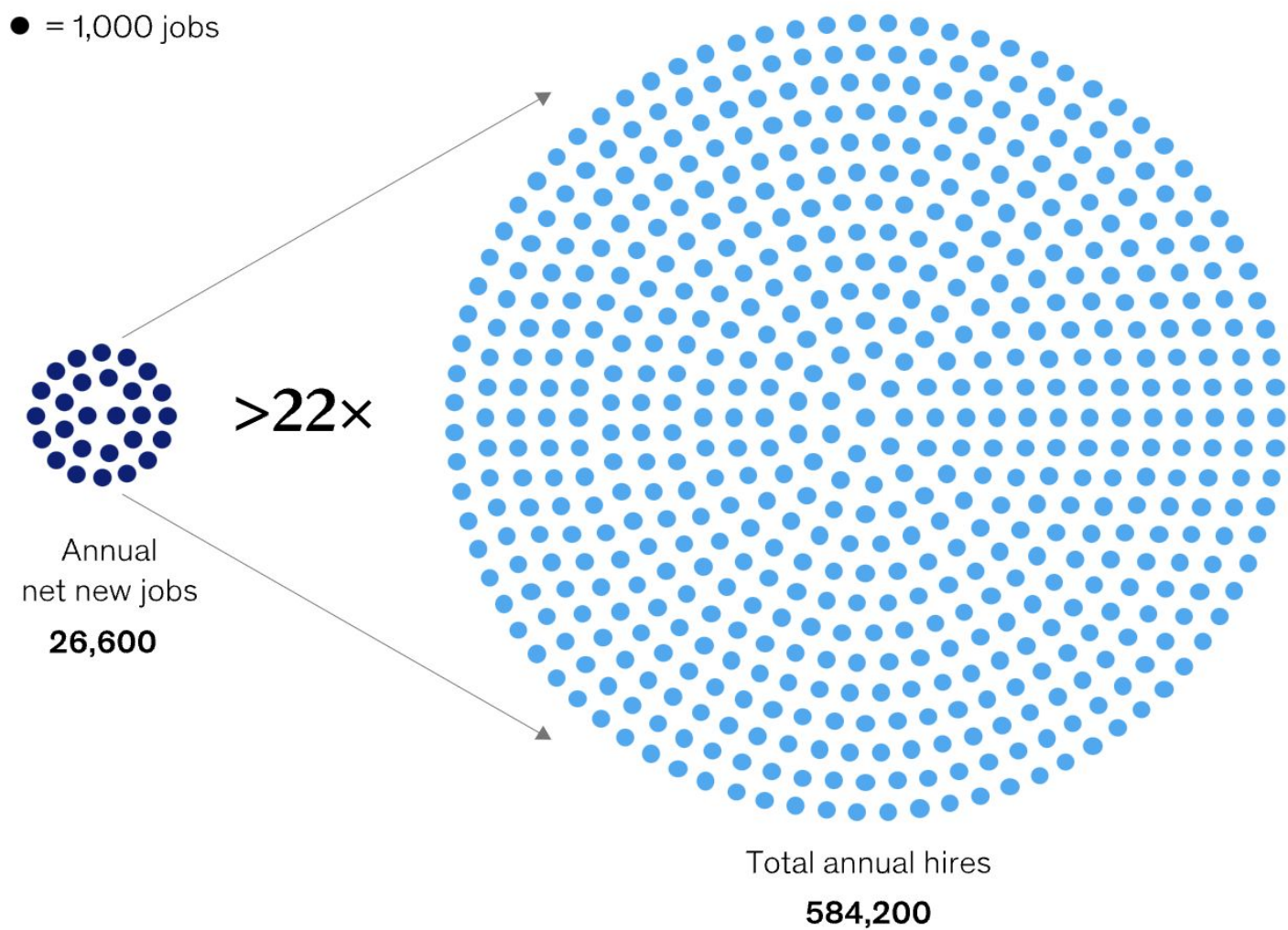
5. Source: Bureau of Labor & Statistics <https://www.bls.gov/news.release/pdf/ecopro.pdf>

McKinsey Projects Growth for Skilled Trades

Annual hiring in the United States for critical skilled roles could be more than 20 times the projected annual increase in net new jobs from 2022 to 2032.

Annual job creation in critical trade categories,¹ number of jobs (average flows per year, 2022–32)

● = 1,000 jobs



Critical trade examples

- carpenters
- construction laborers
- electricians
- glaziers
- heating, air-conditioning, and refrigeration mechanics and installers
- industrial-machinery mechanics, machinery maintenance workers, and millwrights
- ironworkers
- material-moving-machine operators
- plumbers, pipe fitters, and steamfitters
- solar photovoltaic installers
- welders, cutters, solderers, and braziers
- wind turbine service technicians

¹Identified based on 3 criteria: frequent migration to other jobs (or significant portions of workforce entering retirement), extensive training requirements, and criticality to public and private infrastructure, clean-energy projects, and advanced manufacturing.

McKinsey & Company





iCEV Surveys 1,349 CTE Educators

iCEV asked the experts, teachers and administrators, about the future of CTE.

- What are the most pressing challenges facing CTE educators today?
- How can we effectively tackle these challenges?
- Which essential skills are in highest demand in your state's workforce?

Success Story: Missouri

“ We implemented a **droning/aviation pathway** because elementary students had such a drive and passion for robotics (as a result of an afterschool club). We now have multiple high school students who are working as drone operators for a local company.

District Leader
Missouri



Success Story: New Jersey

“ One of the students in our **health occupations** program graduated in 2017. Since then this student has been promoted 5 times and currently works in assisting immigrants with cancer in getting the proper medical care and coverage. Through our program the student earned their First Aid/CPR certifications, performed clinicals, and completed two Rutgers graduate courses in healthcare.

District Leader
New Jersey

Success Story: Massachusetts

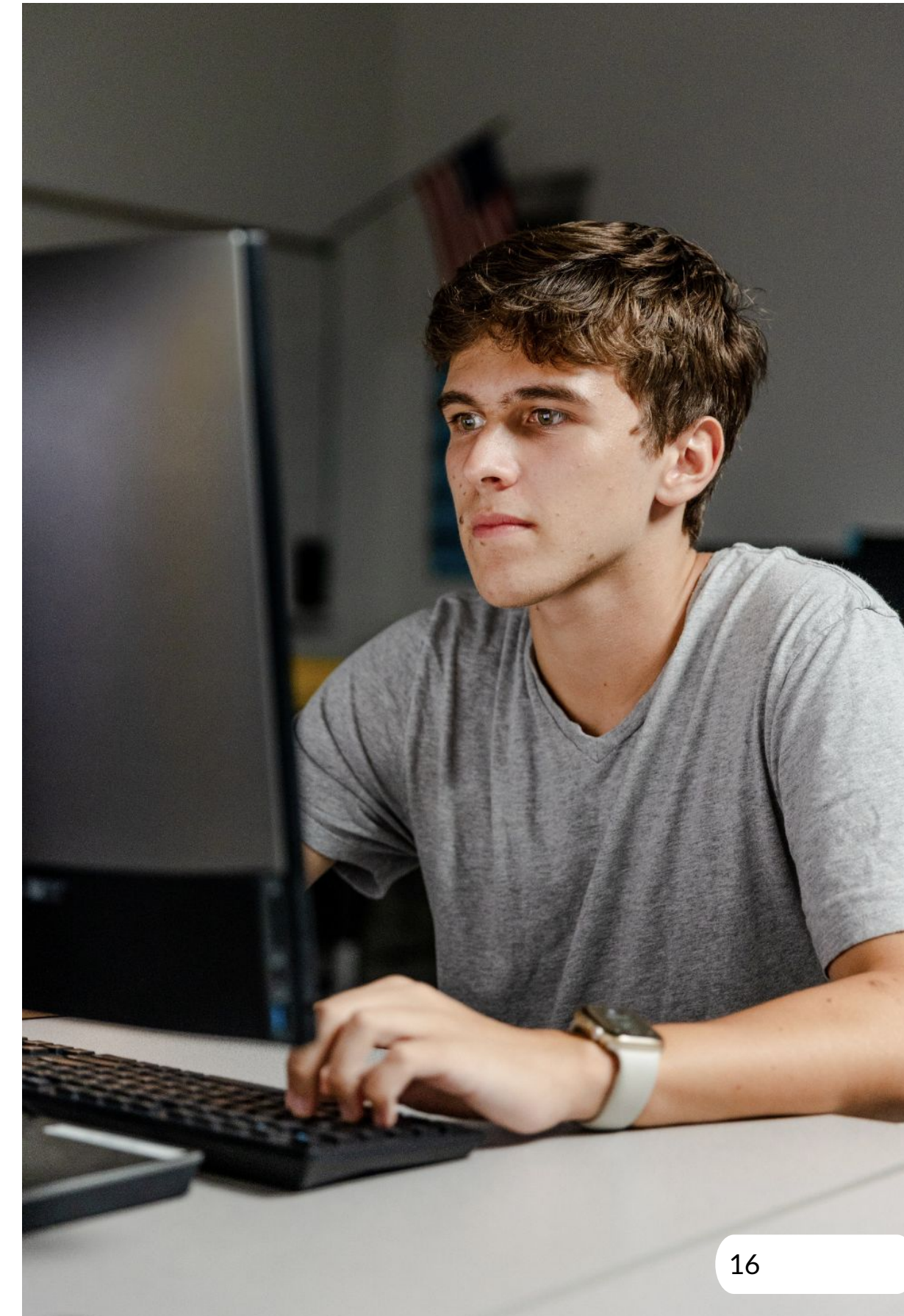


One success story from our district in Massachusetts highlights the strong partnership we have with local employers through our co-op and internship programs.

Over the past few years, students in our **Engineering Technology Pathway** have been placed in internships with leading local firms. These students gained invaluable hands-on experience, and many were offered permanent positions upon graduation. One such student completed their internship, received multiple certifications in CAD software, and is now employed full-time as a design engineer.

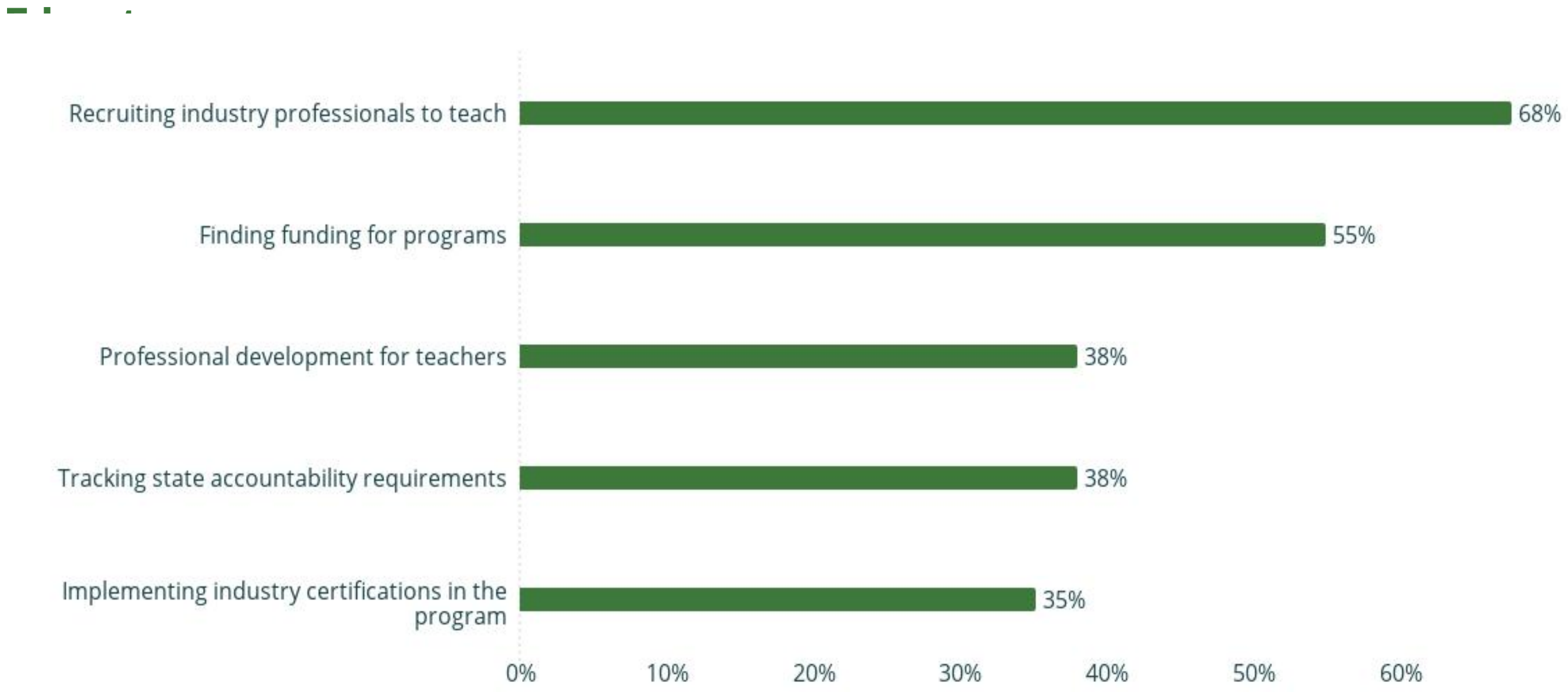
This experience not only **benefited the student by developing work skills, it also benefited our local employer by filling a key role in the company.**

District Leader
Massachusetts



CTE Leaders Speak Out

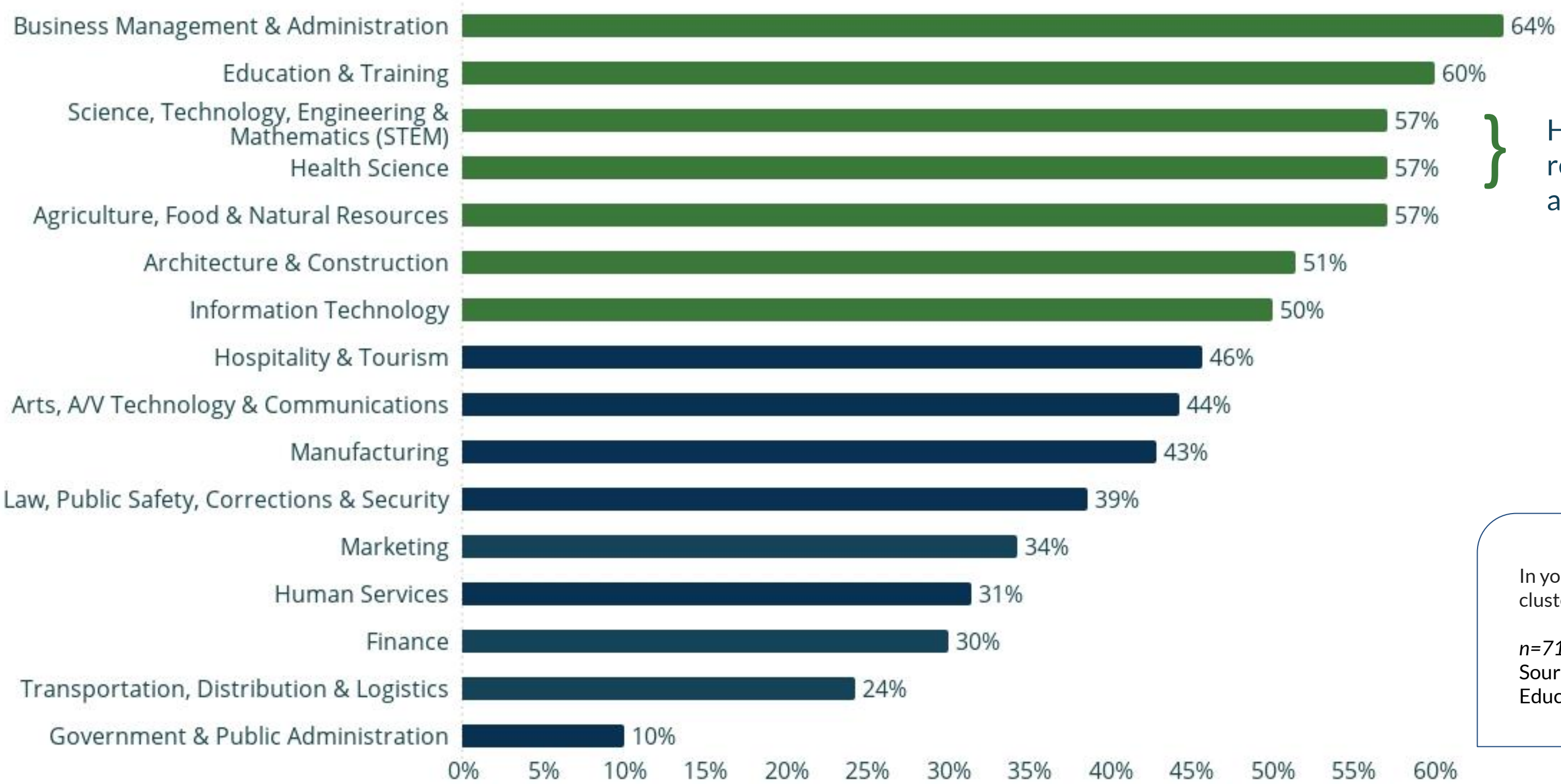
Recruiting Professionals to Teach Ranks as the Number 1 Problem for District



Which of the challenges below are MOST frustrating for you? Check all that apply.

n=71 CTE District Administrators
Source: Catapult X 2024 Survey on CTE Education

Top 7 Career Clusters Offered by District Respondents

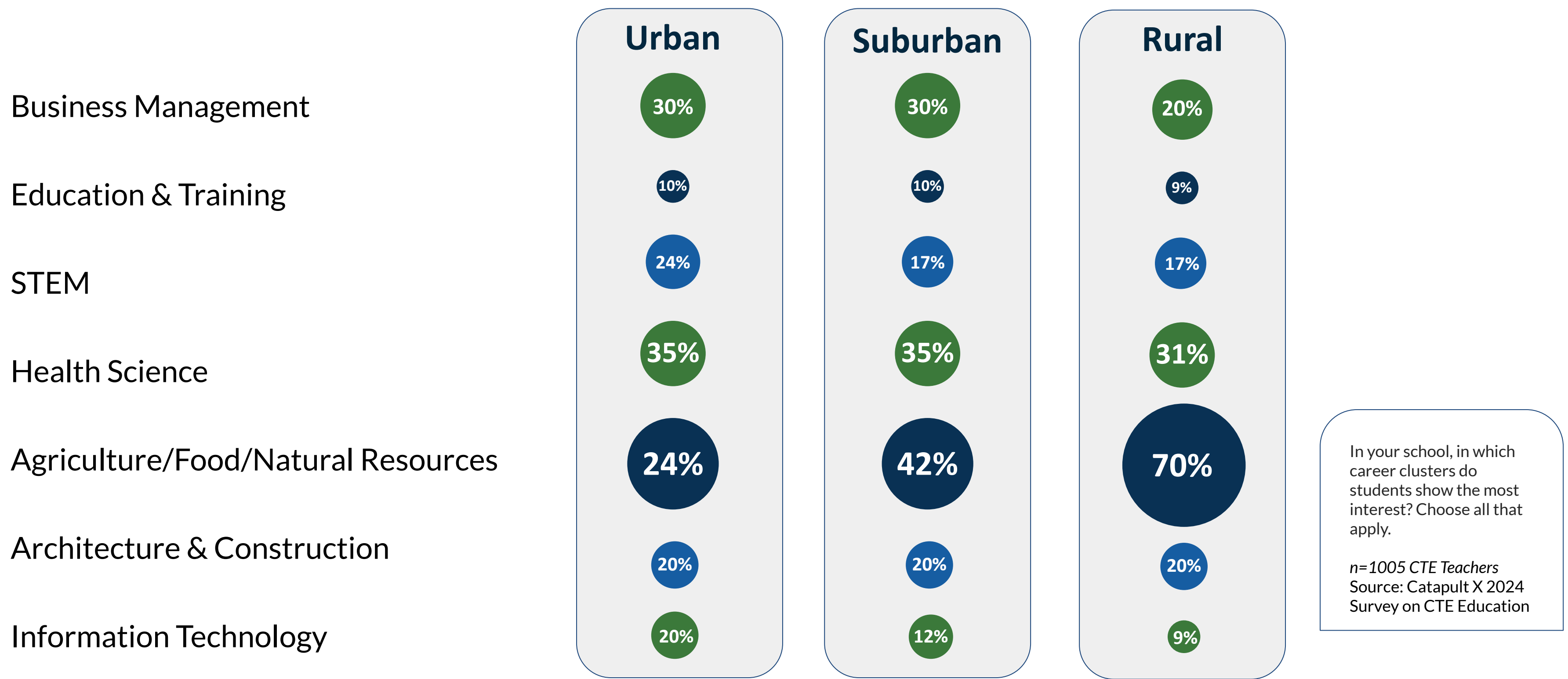


} Highest student enrollment reported by district administration

In your district, which of the following CTE clusters are available? Check all that apply.

n=71 CTE District Administrators
 Source: Catapult X 2024 Survey on CTE Education

Student Interest in Career Clusters Varies by Region





CTE programs sit at the intersection of academic rigor and real-world application.

What makes these programs uniquely powerful is their ability to teach the most challenging skills through immersive, hands-on experiences.

When you combine classroom instruction from industry veterans with work-based learning and industry certifications, you're not just teaching skills, you're building career confidence.

Dusty Moore
President / CEO
iCEV



The Student Readiness Gap

CTE Exploration vs. Concentration

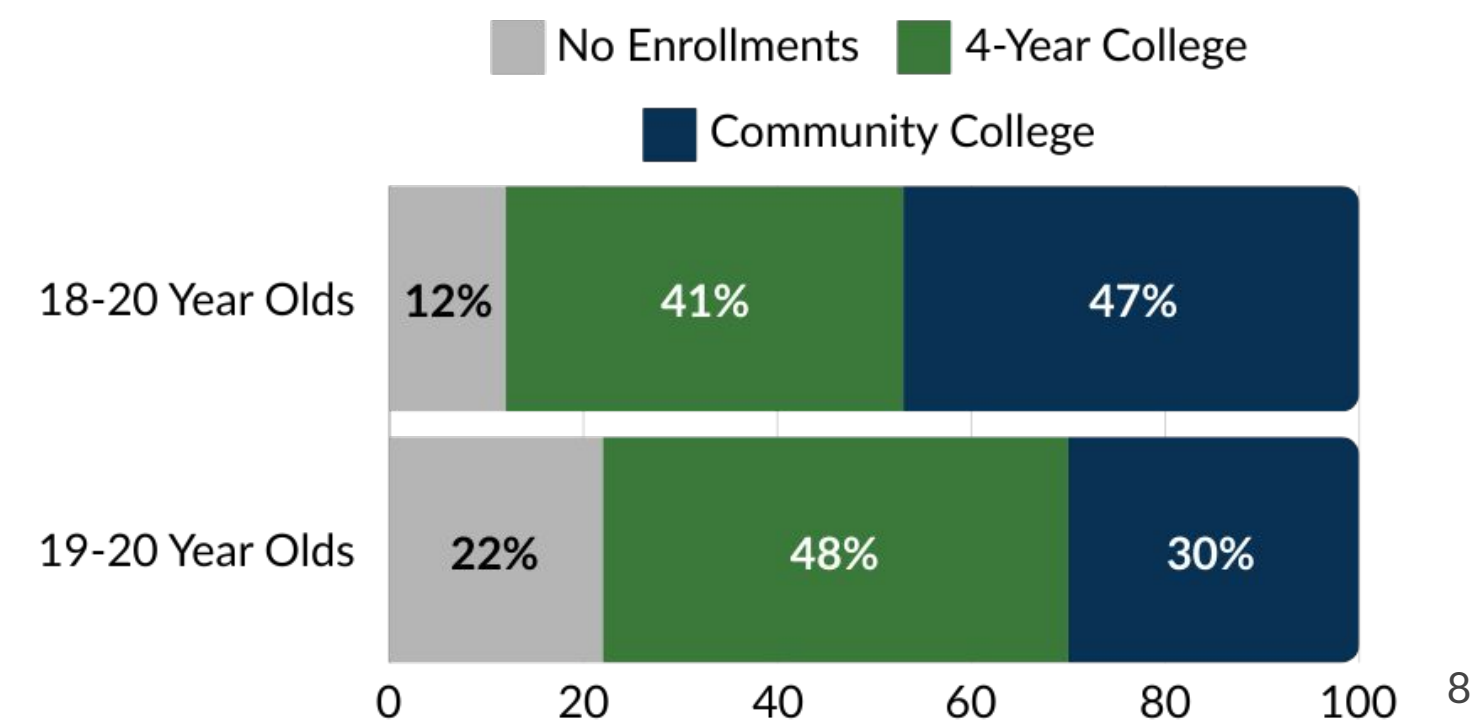
While **77%** percent of high school students took at least one CTE course in the mid 2010's, only **37%** of students went on to earn at least two credits in a single CTE career cluster, suggesting that students are open to exploring CTE pathways but may need encouragement to concentrate on a path.⁷

8. CTE data story: insights into how CTE can improve students' income after they graduate. (2019). Ed.gov. <https://www2.ed.gov/datastory/cte/index.html>

Dual Credit Availability

Research indicates that 88% of students in dual credit programs pursue higher education and typically complete degrees faster than their peers.⁹

First College Matriculation Among Former Dual Enrollment Students

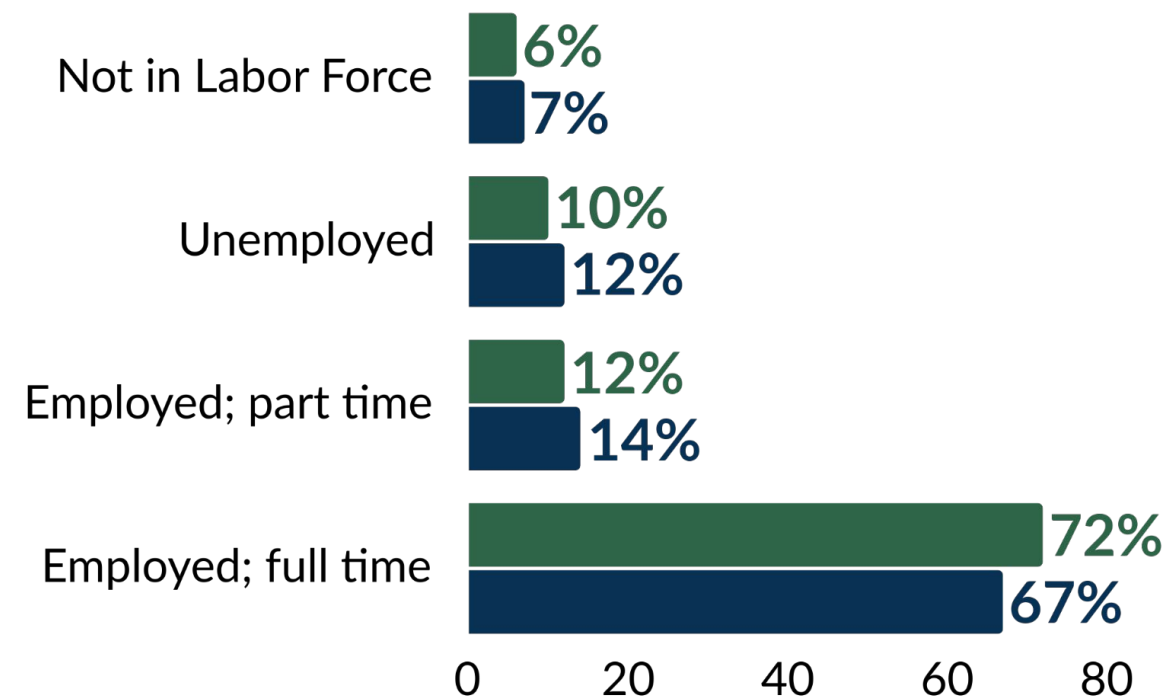


10. Fink, J., Jenkins, D., & Yanagiura, T. (n.d.). September 2017 What Happens to Students Who Take Community College "Dual Enrollment" Courses in High School?
 9. <https://ccrc.tc.columbia.edu/media/k2/attachments/what-happens-community-college-dual-enrollment-students.pdf>

CTE Improves Outcomes

Improved Professional Success

Employment Status of CTE-Completers and Non-Completers 8 Years After Graduation



Further underscoring the benefits of CTE education, students who complete 2 or more courses in a single CTE pathway are 5% more likely to be employed full time and are 4% less likely to be working part time or unemployed 8 years after graduating from high school.⁸

Credentialing Students via CTE

Access to industry certifications via CTE allows students to demonstrate capability to employers immediately after graduation.

10. Flynn, L. (2020, May 6). Pathways through CTE Across America. Nhanow.com; National Healthcareer Association . <https://info.nhanow.com/learning-leading-blog/pathways-through-cte-across-america>

11. CTE data story: insights into how CTE can improve students' income after they graduate. (2019). Ed.gov. <https://www2.ed.gov/datastory/cte/index.html>

The CTE Teacher Experience Gap

Recruiting Educators with In-Field Experience

- CTE teachers were the most likely of all grades 9-12 public school instructors to be newer to the profession, with **10% having less than three years of teaching experience**. In addition, 29% had three to nine years of experience, 36% had 10 to 20 years of experience and 25% had over 20 years of experience.
- About 38% of public CTE instructors entered teaching through an alternative certification program, a much higher rate than overall instructors (19.4%), **Before going into teaching, 65.5% of public CTE teachers worked in the private sector.**

<https://ctepolicywatch.acteonline.org/2023/07/analysis-of-national-data-illustrates-cte-teacher-shortages.html>

CTE Educators with Industry Experience

70%
Reported Industry Experience Prior to Teaching

30%
Did Not Have Industry Experience Before Teaching



Before your job as an educator, did you hold a professional position in the health science industry?

n=110 CTE Health Science Educators

Source: [Bridging the 10 Million Healthcare Worker Gap](#)

Top 5 Skills in Demand by Employers

As Identified by District Leaders



In your district, think about the soft skills students need to be ready for the workforce. Which are MOST in demand by industries in your district? Check at least 1 and no more than 3.

n=68 CTE Leaders
Source: Catapult X 2024 Survey on CTE Education

Top 5 Skills Most Difficult for Students to Learn

As Identified by Teachers



Think about the soft skills students need to be ready for a career. Which of the skills below are the MOST difficult for students to learn? Check at least 1 and no more than 3.

n=1005 teachers
Source: Catapult X 2024 Survey on CTE Education

Top Essential Skills Needed to be Career Ready

As Identified by CTE Administrators and Teachers

1. Work Ethic

2. Critical Thinking

3. Communication

This was a forced rank question to determine the top essential skill for students. Data were piped in from the questions on slide 24 & 25

You chose [piped answers] Please rank the most important soft skills [essential skills] a student needs to be career-ready. Drag and drop the options below where #1 is the most important.

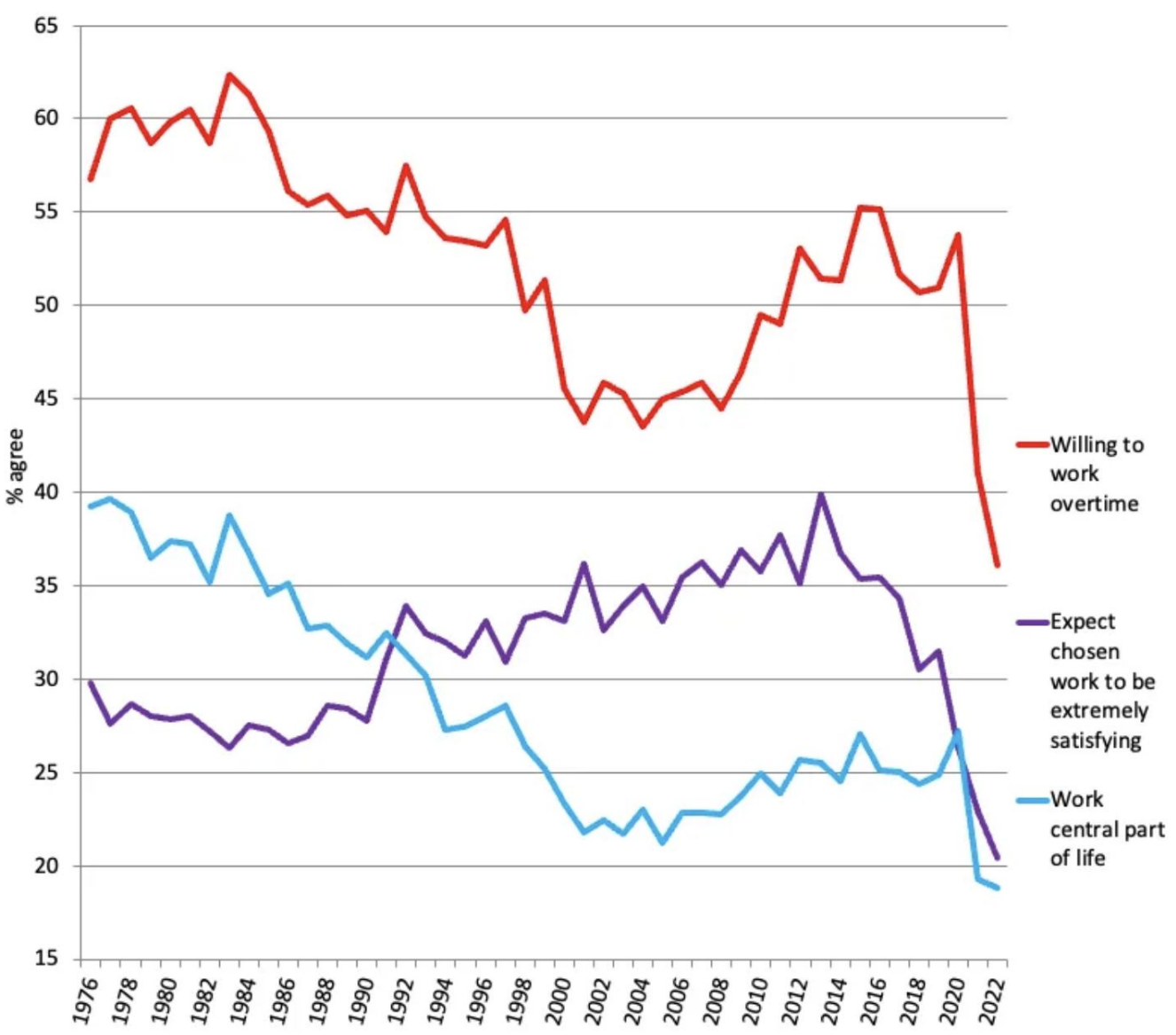
n=1005 teachers

n=68 CTE leaders

Source: Catapult X 2024 Survey on CTE Education

Student Work Ethic Dropped Post-Pandemic

Student Voice Across the Generations



Up until a few years ago, the work ethic news was positive for Gen Z (those born 1995-2012, and 18 years old 2013-2030). After declining from Boomers to Millennials, work ethic made a comeback among Gen Z 18-year-olds in the 2010s.

Until it didn't. The number of 18-year-olds who said they wanted to do their best in their job “even if this sometimes means working overtime” suddenly plummeted in 2021 and 2022 (see Figure 1). In early 2020, 54% of 18-year-olds said they were willing to work overtime. By 2022, it was 36%. That’s a (relative) drop of 33% in just two years. It’s also an all-time low in the 46-year history of the survey.

Jean M. Twenge
 GenerationTechBlog.com

Figure 1: Work centrality, U.S. 12th graders, 1976-2022. Source: Monitoring the Future.
 Similar to Figure 8.1 in the “Future of Work” section of the Future chapter of Generations



Today's students seem to be asking a profound question that previous generations rarely voiced: 'Why does work matter to my life?' It's not a sign of defiance—it's an opportunity for us to show students how CTE opens doors to personal fulfillment.

The data tells us that student motivation has shifted post-pandemic, but I see this as our moment to reimagine engagement. By investing in professional development for our educators, securing adequate funding for hands-on learning experiences, and creating materials that connect classroom work to real-world impact, we help students find their path forward and strengthen the workforce of the future.

Dusty Moore
President / CEO
iCEV



Toward a Career-Ready Future

3 Actionable steps for CTE Programs

1

Invest in CTE Teaching Excellence

The Challenge

- 35 states report critical CTE teacher shortages in manufacturing, IT, and health sciences (Staff, K., 2023, Kappan Online)
- District administrators rank recruiting professionals to teach as their #1 challenge (Catapult X 2024 Survey on CTE Education, n=71 CTE District Administrators)

Recommended Actions

- ★ Create streamlined, funded pathways for industry professionals to enter teaching
- ★ Develop professional development systems that keep educators current with industry trends
- ★ Provide comprehensive, ready-to-use curriculum resources aligned with standards
- ★ Establish mentorship programs connecting experienced and new teachers

Toward a Career-Ready Future

3 Actionable steps for CTE Programs

2

Prepare Career-Ready Students

The Challenge

- Students struggle most with critical thinking (47%) and communication (45%) according to teachers (Catapult X 2024 Survey on CTE Education, n=1005 teachers)
- Work ethic ranks as the most challenging skill to develop, according to both teachers and district leaders (Catapult X 2024 Survey on CTE Education)
- While 77% of students take CTE courses, only 37% complete two or more courses in a single pathway (ED.gov CTE Data Story, 2019)

Recommended Actions

- ★ Adopt engaging, career-focused curriculum that connects learning to real-world applications
- ★ Create clear pathways with industry-recognized certifications
- ★ Integrate essential workplace skills into technical training
- ★ Provide hands-on and digital learning experiences

Toward a Career-Ready Future

3 Actionable steps for CTE Programs

3

Power Industry Growth Through CTE

The Challenge

- Global talent shortage of 85.2 million skilled workers projected by 2030 leading to \$8.452 trillion in unrealized annual revenue (Korn Ferry Global Talent Crunch Report)
- Communication (53%), Critical Thinking (49%), and Interpersonal Skills (31%) are most in demand by employers (Catapult X 2024 Survey on CTE Education, n=68 CTE Leaders)

Recommended Actions

- ★ Prioritize high-growth industry needs with targeted curriculum
- ★ Provide industry-recognized certification preparation and testing
- ★ Create a media relations campaign, including social media, to raise awareness
- ★ Implement real-world scenario-based learning resources
- ★ Develop industry partnership programs for both funding & internships

Where iCEV Comes In



CTE educators are quietly training America's future workforce in classrooms across the nation.

For 40 years, those of us at iCEV have witnessed their extraordinary impact—mentoring students, managing complex programs, meeting rigorous industry standards, and guiding students toward industry-recognized certifications.

These educators don't just teach—they transform lives, strengthen industries, and build communities. That's why at iCEV we pour everything into creating tools worthy of their mission, ensuring every CTE educator has the support needed to keep changing the world, one student at a time.

Dusty Moore
President / CEO
iCEV



About iCEV

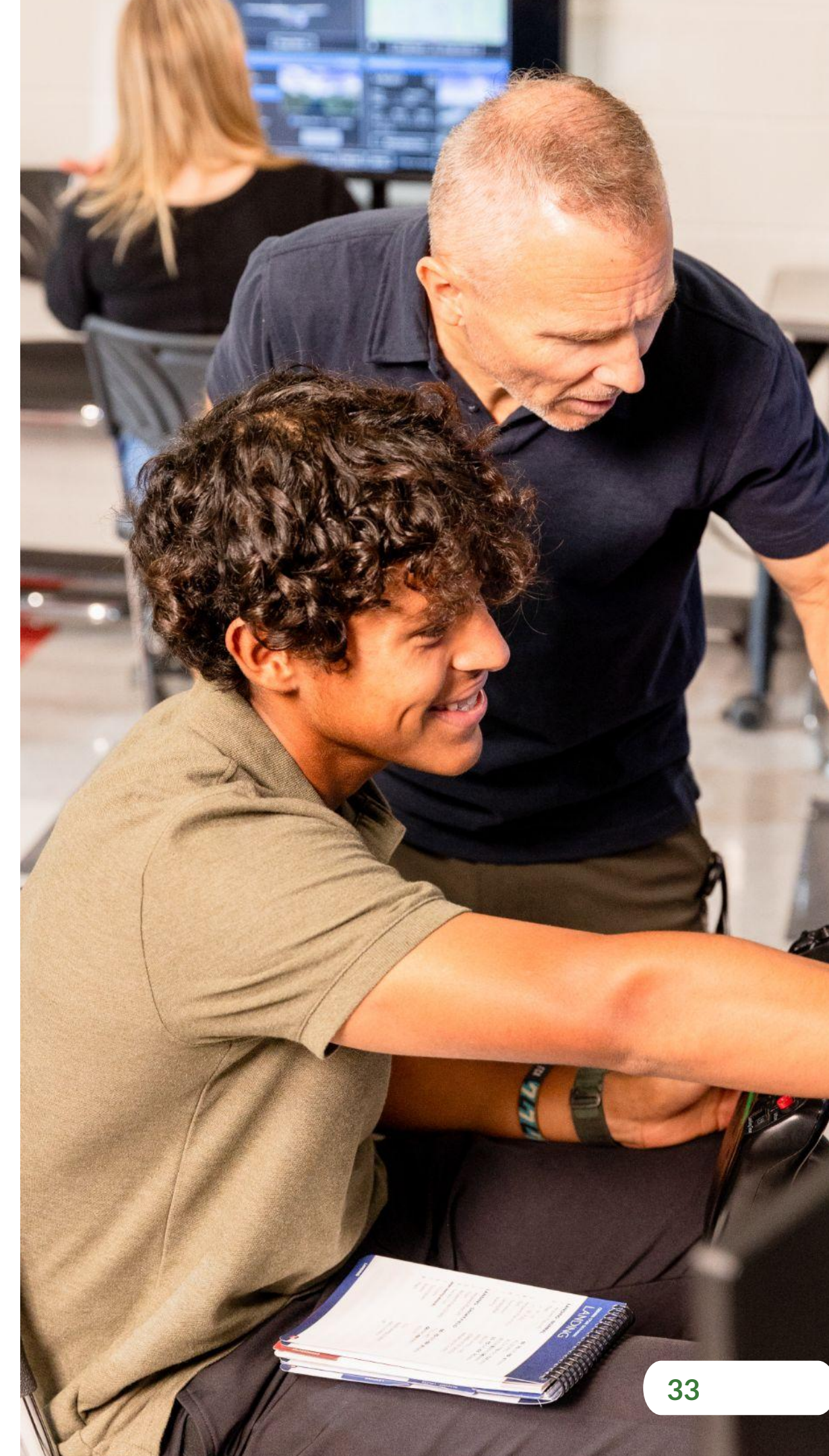
A Comprehensive CTE Solution

Since 1984, [iCEV](#) has specialized in providing quality CTE curriculum and educational resources.

iCEV is the most comprehensive online resource for CTE educators and students, offering curriculum for several major subject areas, including agricultural science, trade & industrial education, business & marketing, career exploration, family & consumer science, trade & health science, law enforcement and STEM education.

iCEV also acts as a certification testing platform for industry certifications. Recognized companies and organizations utilize iCEV as the testing platform for their certifications.

Additionally, iCEV offers [Eduthings](#), a CTE data management platform that simplifies reporting for industry certifications, work-based learning, CTSO participation, and more.



Turn Passions into Career Callings

iCEV as a Comprehensive CTE Solution

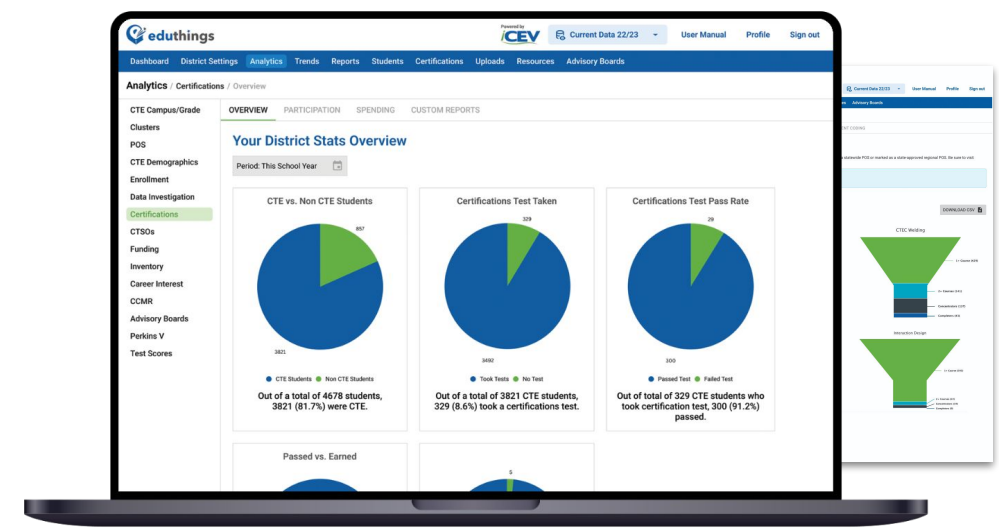
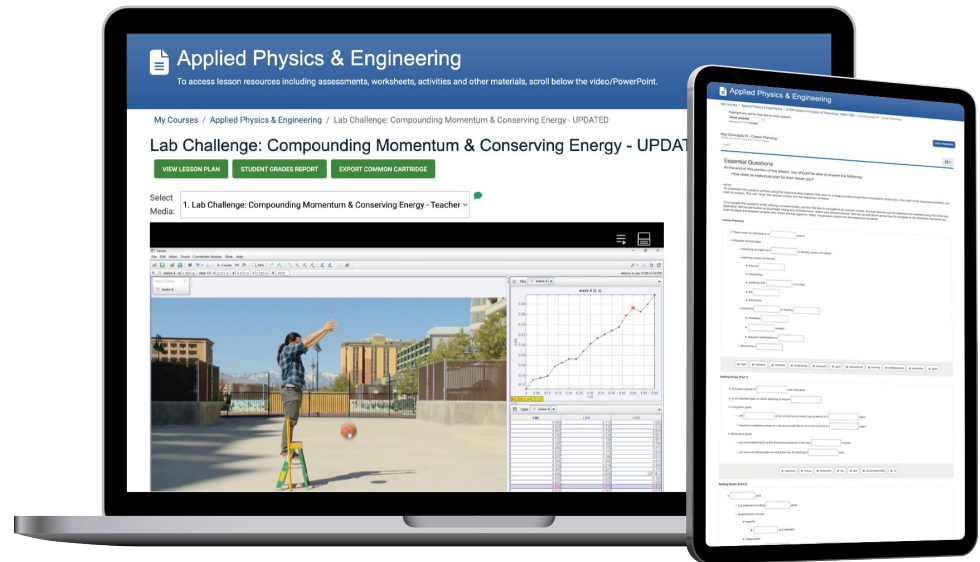
All-Inclusive,
Standards-Aligned

Curriculum &
Instructional Materials

Industry-Driven, Industry-
Recognized, Industry-Valued

Certifications
& Alignments

Data Reporting
& Analysis with



Learn More About iCEV

Want to learn more about how iCEV supports CTE educators with:

- 1** Standards-Aligned Curriculum
- 2** Certification Testing & Preparation
- 3** Data Reporting & Analysis

iCEV is Your Partner in Empowering CTE Learners

We're educators with a passion for what we do. By partnering with us, you gain access to a responsive team of real people with nearly 40 years of experience. We're here to provide CTE learners like yours better learning experiences today so they'll have more career opportunities tomorrow.

Book a Demo at:
www.icevonline.com/demo

Methodology

This research was conducted by Catapult X, an independent market research firm specializing in science, STEM, and CTE education.

Data were collected in 2024, using a mixed methods approach: secondary data from trusted sources, and surveys of educators.

n=1,349 CTE educators overall: $\pm 3\%$ MOE

- n=105 CTE district administrators: 10%MOE
- n=1,221 CTE educators: 3% MOE
- n=23 did not finish the survey

95%

Confidence Interval

Resources

By Order of Appearance

1. THE GLOBAL TALENT CRUNCH. (n.d.). https://www.kornferry.com/content/dam/kornferry/docs/article-migration/FOWTalentCrunchFinal_Spring2018.pdf
2. The Future of Jobs Report 2023. (2023). World Economic Forum. <https://www.weforum.org/publications/the-future-of-jobs-report-2023/future-of-jobs-data-explorer/>
3. Data source: UN WPP (2022); HMD (2023); Zijdemans et al. (2015); Riley (2005) – Learn more about this data [OurWorldInData.org/life-expectancy](https://www.ourworldindata.org/life-expectancy) | CC BY
4. News Release: Bureau of Labor & Statistics <https://www.bls.gov/news.release/pdf/ecopro.pdf>
5. News Release: Bureau of Labor & Statistics <https://www.bls.gov/news.release/pdf/ecopro.pdf>
6. McKinsey, Tradespeople Wanted for Critical Trade Skills in the US (2024)
<https://www.mckinsey.com/capabilities/people-and-organizational-performance/our-insights/tradespeople-wanted-the-need-for-critical-trade-skills-in-the-us#/>
7. Catapult X: 2024 Survey on CTE Education
8. CTE data story: insights into how CTE can improve students' income after they graduate. (2019). Ed.gov. <https://www2.ed.gov/datastory/cte/index.html>
9. <https://ccrc.tc.columbia.edu/media/k2/attachments/what-happens-community-college-dual-enrollment-students.pdf>
10. Flynn, L. (2020, May 6). Pathways through CTE Across America. Nhanow.com; National Healthcareer Association .
<https://info.nhanow.com/learning-leading-blog/pathways-through-cte-across-america>
11. 11. CTE data story: insights into how CTE can improve students' income after they graduate. (2019). Ed.gov. <https://www2.ed.gov/datastory/cte/index.html>
12. Catapult X: Bridging the 10 Million Healthcare Worker Gap <https://www.icevonline.com/bridging-the-10-million-health-worker-gap-the-impact-of-cte-educators>
13. Twenge, Gen Z Really Does Have a Work Ethic Problem https://www.generationtechblog.com/p/gen-z-really-does-have-a-work-ethic?utm_source=publication-search