



Breaking Ground: A First Look at American High School Skilled Trades Education

Executive Summary

May 2020 Note to Our Readers

When we set out to conduct research on the state of skilled trades education in U.S. public high schools, the economy was booming, construction was abundant, and employers were clamoring for a wide range of skilled trades professionals. We designed our study to incorporate predictions of a steady flow of demand for tradespeople over the next decade. And then came the COVID-19 pandemic, thrusting the economy into turmoil.

While the labor market is likely to change significantly in the coming year, our study remains relevant. The demand for trades professionals will not fade away. The country's infrastructure needs will persist, as will the need for skilled tradespeople to maintain the electrical, HVAC, and other systems that power the hospitals, offices, and factories that make our country run.

To answer this need, we must develop a steadily flowing talent pipeline—one that extends from America's youth to adult jobseekers and provides well-paying opportunities to a broad range of people. To build that pipeline we must ensure that each student rising through our secondary education system has access to high quality trades education – to help them prepare for essential, in-demand careers that don't necessarily require a four-year college degree, and to enhance their education through relevant, hands-on learning.

In the best of times, our career and technical education system has faced challenges, which we describe in our report. In the midst of a crisis like the current pandemic, providing high-quality classroom and hands-on learning experience is incredibly challenging, if not impossible.

As the engines of the economy begin to fire again and skilled trades educators return to delivering in-person instruction and work-based learning experiences, we hope that our report provides a roadmap for overcoming challenges and building on the pockets of innovation and excellence we found in our research. This work remains essential to ensure preparation of the trades workforce that our economy will require as it recovers from the pandemic and well into the future.

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Introduction

The United States faces a critical shortage of skilled trades workers—now and for years into the future. Demand is immense and growing for the electricians, carpenters, plumbers, and all who build, maintain, and repair the infrastructure that supports the entire U.S. economy. For the past decade, the trades have ranked among the top five hardest worker roles to fill.¹ But due to an aging workforce, misconceptions about trades careers, and limited awareness of opportunities in the trades, there simply aren't enough people who have mastered the skills and developed the talent required to perform these essential roles. This gap is already slowing down projects financed with public or private dollars, driving up consumer costs, and limiting the ability of American companies to adapt quickly to major changes brought on by new technology and regulation.

Where are the Americans with the finely honed skills needed to keep our country running? Who will build the highways that trucks travel to fill grocery store shelves and maintain the systems that keep hospitals functioning to save lives? Who will service the electrical grid that powers everything from schools to stock exchanges? Who will build and repair our homes, our cars, and our energy sources? Where is the pipeline of talented people who love and excel at working with their hands? And how many Americans are missing out on promising career opportunities because our education and training programs can't keep up with demand?

One vital source of prospective tradespeople are the high school students who participate in career and technical education (CTE) programs in the skilled trades. Trades education at the high school level should be a key onramp to good jobs and a broader preparation ecosystem that includes postsecondary education and training options. High-quality skilled trades education in U.S. high schools could be not only a path for students to access well-paying and fulfilling careers, but also a strategy to meet employer demand for qualified workers, strengthening our economy at the regional, state, and national levels.

For all of the recognized labor market need and economic promise of the skilled trades, there has never been a comprehensive examination of the state of skilled trades education in American public high schools. Little is known about this potentially fruitful part of the nation's talent pipeline and the extent to which the current education system is meeting the needs of students and our economy. JFF took a deeper look at this landscape at the request of Harbor Freight Tools for Schools, a program of The Smidt Foundation that seeks to advance excellent skilled trades education in American public high schools. What we found shed light on major gaps, some bright spots, and significant opportunities to adapt current practice to better meet the critical labor needs of our economy—and to create opportunity for young Americans.

Our Research

JFF requested data from the departments of education in all 50 states and the District of Columbia about high school skilled trades programs, students, teachers, and outcomes. We also interviewed state CTE directors about their perspectives on current trends and challenges facing trades education in our nation's high schools, and we conducted an additional 27 interviews with experts from trades and CTE-related organizations.

The difficulties we encountered in carrying out this research are emblematic of and integral to the story about the challenges this field faces. We were able to obtain a variety of data on program offerings, enrollments, and outcomes from a total of 38 states, representing approximately 82 percent of the nation's public high school students.² We also spoke with state CTE leaders in all 50 states and the District of Columbia. However, not a single state was able to provide a complete set of the data requested. Fourteen states, including Washington, DC, either did not respond at all, indicated that education departments were too understaffed to provide the data, or said they simply did not collect the information we sought.

The stark reality our research revealed is that there simply is no clear and comprehensive national data on high school skilled trades education. Most state education departments do not reliably collect basic information that could tell students, staff, parents, employers, and policymakers how many young people enroll in and complete skilled trades programs in high school, let alone illuminate these students' journeys to careers and further education after graduation.

Further, our efforts to collect quantitative data in many ways mirrored what our interviews with state CTE leaders revealed. Skilled-trades education sits within state CTE systems that too often fail to prioritize the skilled trades and lack sufficient resources at the state and classroom levels. However, our interviews with state agency leaders and other professionals also uncovered innovations and promising practices that could guide the way forward to a system that more effectively addresses our nation's labor needs and creates opportunities for more of our young people to pursue trades careers.

The Skilled Trades Covered in This Report

We employ the definition of “skilled trades” used by Harbor Freight Tools for Schools: “Professions that emphasize the expert use of tools and materials to build or repair products and structures, and which lead to good jobs with strong potential for advancement and high wages.”

The large majority of skilled trades coursework covers the following trades areas:

- Advanced manufacturing
- Carpentry
- Construction (which can include masonry and other specialties, and sometimes serves as an overall descriptor for courses that include multiple other trades on this list)
- Electrical
- Heating, ventilation, and air conditioning (HVAC)
- Plumbing
- Transportation mechanics and repair
- Welding

We recognize that many high school students study the skilled trades within agricultural courses. However, course categorization practices at the state and local levels make it difficult to determine the extent of trades-specific study within each of these classes. Accordingly, though we recognize trades education may occur in these courses, we have not included agriculture classes in this study.

Key Findings

High school skilled trades education offers students high-value opportunities.

Students participating in skilled trades classes can gain not only valuable technical skills and work experience, but also the academic and personal skills needed to be successful in whatever path they choose after high school. Some start earning significant wages in their chosen trade while still in high school.

Despite these opportunities, trades education practitioners report negative perceptions among students, families, and counselors.

This was a consistent theme echoed by educators and administrators across nearly every state. Interviewees routinely report that trades education is too often associated with “dirty” shop classes leading to dead-end jobs. This misperception leads many students and families to overlook opportunities in the trades.

Most of the skilled trades education data that states collect are not used to improve programming or ensure that programs meet labor market needs.

Rather, they are used primarily for compliance purposes. Most of the high school skilled trades data that states collect are interwoven with broader CTE data that states report to the federal government to meet requirements for receiving federal funding. Overall, the data are insufficient to paint a complete picture of student participation and results, or to make a connection to economic development needs or plans.

To the degree the data reveal trends, they show a misalignment between student participation and labor market demand for skilled trades workers.

Some subjects like automotive services and welding are enrolling students at much higher rates than other areas like construction, manufacturing, plumbing, and electrical. If these practices continue, the result will be even more significant shortages of skilled workers in the trades areas most in need of labor supply.

The data also show glimpses of the positive outcomes many high school trades students achieve in graduation, college enrollment, and employment. But participation among student subgroups is uneven; some, like girls and students of color, are not well represented.

Trades education faces looming teacher shortages and significant funding constraints.

With an aging teacher workforce and stiff competition from higher-paying jobs in industry, skilled trades teaching positions will be increasingly difficult to staff. States, districts, and programs face overall resource challenges that can limit access to quality programming and up-to-date equipment and materials.

These challenges stand in stark contrast to the exciting developments and renewed interest in CTE overall, as well as the innovations in skilled trades education that show how powerful these approaches can be.

CTE is widely supported and on the tips of policymakers' tongues; labor shortages are causing employers to look to high schools in ways they haven't previously to build their talent pipelines; and there is renewed interest in apprenticeship and pre-apprenticeship, an area in which the trades have long offered strong models and outcomes. Given this attention, this is a rare moment of opportunity for alignment among educators, industry, policymakers, and students to fulfill the promise that trades education offers.

Key Recommendations: A Call for Greater Understanding and Action

Ensuring widespread access to quality high school skilled trades education should be a concern for our nation, states, and communities—for both individual and family success, as well as the need to meet industry demand and keep our economy thriving. States and regions need to better understand their own labor market trajectories and build alliances to align supply and demand across education and industry to expand quality trades education. They also need to consider who might have insufficient access to the opportunities offered by the trades.

Based on our research, we offer recommendations to those we view as critical stakeholders in these efforts.

State Education Leaders

- Understand deeply and systemically the labor market needs and career opportunities associated with the skilled trades in their state, both statewide and by region, and ensure this information is communicated across school districts and integrated into planning and implementation.
- Support the development of expanded partnerships between secondary and postsecondary systems to provide new equipment for trades programs, support dual enrollment programs, and develop transparent pathways for students to move seamlessly from secondary to postsecondary levels of trades education.
- Align state systems around clear standards for high-quality CTE, collecting and using data and maximizing the impact of federal funding.

State Labor and Workforce Development Leaders

- Work with relevant state agencies to gather and update data on employment and job openings, infrastructure needs, and necessary skills and credentials. Share, validate, and enhance this information with regional and local partners in education, workforce development, industry, and other stakeholders, and make it available to educators, families, and students.
- Support the development of new apprenticeships or expansion of existing ones that help grow the workforce. Work with education systems to connect opportunities in high school to further apprenticeship opportunities.
- Take advantage of structures like workforce boards and other networks to convene groups that bring secondary and higher education, industry, union, and workforce perspectives to the table to strategize for increasing trades education participation and improving the effectiveness of the education system in meeting the needs of our economy.

Industry and Union Leaders

- Get deeply involved in providing quality skilled trades education in high schools: offer financial assistance, materials, and direct investment at the program level (e.g., mentoring, curriculum advisement, and supplies); support the trades teaching workforce through externships, co-teaching, and encouraging employees to spend time in classrooms as co-teachers and presenters.
- Offer quality work-based learning opportunities in and beyond high school, including expanding access to high-quality apprenticeships and career ladders for students to access after graduation.
- Provide support for recruitment campaigns with strong track records aimed at elevating the trades and encouraging participation in trades education. Fund and support campaigns with demonstrable positive outcomes for students. Advocate for state and federal investments to support skilled trades education, and reach out to state and school district leaders to understand the challenges of providing high school trades education.

Elected Officials

- Work to increase funding to ensure widespread access for high school students to high-quality skilled trades education.
- Set clear goals connecting trades education to public infrastructure spending.
- Invest in the data systems required to inform sound policy plans, decisions, and accountability.
- Exert leadership in this area. Communicate both the labor market need for trades workers and the importance of making skilled trades careers available to a broader segment of students. Provide opportunities for educators and industry to convey needs and opportunities to lawmakers. Go beyond rhetoric and platitudes to demonstrable investment in quality secondary trades education.

CTE Researchers

- Include the skilled trades, in addition to areas like STEM and health care, as a segment to analyze when disaggregating secondary CTE data.
- Undertake longitudinal studies to better understand the education and workforce outcomes of secondary skilled trades students.
- With so much local control of education in states across the country, develop studies to examine trends at the district level to gain insight into areas such as program selection, funding models, and instructional practice to refine our collective understanding of both challenges and effective practice models.

Conclusion

JFF set out to deepen understanding of the landscape of skilled trades education in U.S. public high schools. What we found is a field energized by committed educators and engaged students, a field ripe with possibility to both address critical labor needs and provide powerful career opportunities for young people. But what we also found are systems that are not sufficiently prioritizing the trades to ensure a pipeline of future workers and allow a broad range of students to have access to trades careers.

The challenge is to move from a field decorated with patches of excellence to one in which students in every state across our country have full access to well-funded and well-equipped programs, taught by skilled educators, in partnership with employers who can offer opportunity.

This report illuminates the uneven strength of skilled trades education in public high schools across our country. It also underscores the many gaps in our understanding of the landscape of this important sector, one that could be a launchpad for young people to learn, grow, and pursue meaningful careers and further training and education. This study also outlines a few of the promising policies and practices undertaken by federal, state, and local leaders to dramatically improve and connect high school skilled trades education to the world of work and opportunity.

At its best, skilled trades education is project-based and hands-on, requires knowledge acquisition, collaboration, experimentation, precision, and problem solving—the very qualities sought in classrooms of all subjects, and in the next generation of workers and community builders. It is our hope that educators, policymakers, and leaders from business, labor, and communities across America will utilize this first-of-its-kind study as a tool for improvement—as motivation to enhance existing programs or as provocation to revitalize programs that are not meeting the needs of young Americans or our economy.

Endnotes

¹ “2018 Talent Shortage Survey,” ManpowerGroup Solutions, accessed June 8, 2019, <https://insights.manpowergroupsolutions.com/2018-talent-shortage-survey/>; “Closing the Skills Gap: What Workers Want,” ManpowerGroup, accessed June 8, 2019, <https://workforce-resources.manpowergroup.com/closing-the-skills-gap-know-what-workers-want/closing-the-skills-gap-know-what-workers-want>.

² Based on 2016 figures: “Table 203.30. Public school enrollment in grades 9 through 12,” Digest of Education Statistics, National Center for Education Statistics, accessed March 9, 2020, https://nces.ed.gov/programs/digest/d18/tables/dt18_203.30.asp.