R Street
Free markets. Real solutions.

R Street Shorts
No. 149
April 2026

Middle-Skills Workforce Development: Addressing Labor Shortages Through Expanded Training Pathways

By Stacey McKenna, Courtney Joslin, Lindsay Heck, Jay Bell

Labor shortages across industries have prompted policymakers to prioritize expanding access to middle-skills credentials—training beyond high school but short of a four-year degree. The need is urgent: Fewer than half of Americans hold credentials beyond high school.

Introduction

Labor shortages across industries have intensified workforce pressures nationwide, creating an urgent demand for workers with specialized skills and training.[1] Middle-skills jobs—those that require training or certification beyond high school but not a four-year degree—represent a fast-growing part of the labor force and account for roughly one-half of all U.S. jobs.[2] Expanding the pool of appropriately qualified workers to fill these positions is a key facet of addressing these shortages.

Middle-skills jobs provide a valuable and feasible pathway to economic mobility for credential-holders, particularly for populations historically underrepresented in postsecondary education.[3] As a result, in recent years, state and federal governments have taken steps to boost worker supply by expanding funding for the nontraditional degree programs that prepare individuals for these types of jobs.[4]

This paper elucidates the context underpinning lawmakers' efforts to expand the middle-skills workforce by describing key social and policy factors driving current labor shortages, examining the intersection of these shortages with middle-skills occupations, and exploring why middle-skills pathways matter for economic mobility and equity. It also highlights examples of recent trends in the ways taxpayer dollars are being used to support this type of training.

In recent years, state and federal governments have taken steps to boost worker supply by expanding funding for the nontraditional degree programs that prepare individuals for these types of jobs.

Understanding Labor Shortages

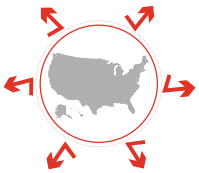
Labor shortages occur when the supply of workers in a particular field falls short of demand.[5] Shortages are measured by comparing the number of people looking for work to the number of open jobs.[6] This section explains the primary drivers of current and projected workforce shortages, with particular attention to how these dynamics affect middle-skills occupations.

The sources included in this paper were verified and active at the time of publication.

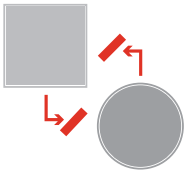
Drivers of Workforce Shortages

Labor shortages can be the result of external factors that dramatically and acutely affect workforce needs or worker availability, like the 2008 recession or the COVID-19 pandemic.[7] However, persistent labor shortages and those predicted to continue into the future are often driven by the intersection of multiple factors—including population shifts, immigration policies, misalignments between training and employer needs, and requirements for occupational licensing—that prevent the workforce from finding equilibrium.[8]

- **Population shifts.** The country's aging population and declining birth rates are leading to labor shortages in certain industries.[9] The workforce currently has a greater number of older individuals than younger ones, which means there are not enough young workers to replace those who are retiring.[10] Slowed population growth compounds this issue, as it lowers the total number of available workers going forward and also increases the cost of labor.[11] This can cause industries to turn toward technological innovation and automation to solve labor-shortage issues. Although technology sometimes improves efficiency, it often changes workforce needs rather than simply curbing the need for workers. This can drive job displacement among individuals who lack key skills but actively increase the need for highly skilled workers, thus worsening existing shortages in those positions.



- **Immigration policies.** Policies that restrict immigration place additional pressure on the U.S. labor force, as foreign-born individuals make up nearly 20 percent of the nation's workers.[12] In 2025, immigrants also accounted for more than 70 percent of U.S. population growth.[13] This is particularly relevant for workforce growth in the context of recent population shifts.[14] Because many industries already rely on immigrant workers to meet their labor needs, policies that hinder immigration will only exacerbate ongoing shortages.[15]



- **Credential misalignment.** Another factor that contributes to labor shortages is mismatches between the skills or credentials a job requires and the training or credentials workers actually have.[16] This greatly affects workers with middle-skills credentials like vocational certificates or other postsecondary, non-degree training, as more than 25 percent of these workers completed programs that do not align with a direct occupational match.[17] Credential/training mismatches typically fall into one of two categories:[18]
  - Those who are highly skilled but work in jobs that do not require those skills
  - Those who have completed programs but who still lack the skills required for available jobs

  These mismatches mean that under-trained workers struggle to find jobs they qualify for, and overqualified workers often remain in positions below their skill level—both of which create inefficiencies that compound workforce shortages.[19]

- **Licensing requirements.** Finally, occupational licensing can contribute to labor shortages, especially for middle-skills pathways. Although licensing aims to protect public health and safety, the proportion of the U.S. labor force required to hold an occupational license to work grew from 5 percent to 25 percent between 1960 and 2020.[20] This is concerning because state-mandated licenses restrict entry into

the workforce and have expanded beyond occupations with relatively high public health and safety risks to include those with much lower risk.[21] Licensing regimes may also worsen the skills-mismatch issue, as they have been shown to increase over-education in long-term U.S. immigrants.[22]

Projected Workforce Gaps

The United States is projected to experience a total labor shortage of 5 to 6 million workers spread over nearly 200 occupations by 2032.[23] Recent analyses have projected severe and persistent shortages in critical areas such as healthcare, education, and management.[24] For example, in the next six years, the United States is expected to face a shortfall of more than 400,000 nurse practitioners, registered nurses, and licensed practical nurses alone and almost 2.9 million management positions across a variety of industries and required education levels.[25]

Current and emerging labor shortages are concentrated among positions requiring some training or education beyond high school.[26] Positions that require a bachelor's degree or higher are expected to account for the majority of the overall shortage—4.5 million unfilled jobs in the next six years.[27] Compounding this challenge, the federal government's recent steps to exclude several training tracks—including those in nursing, social work, and engineering—from updated definitions of "professional" have substantially cut graduate loan eligibility and are likely to further exacerbate bachelor-level shortages.[28] Beyond bachelor's-level positions, a shortage of 750,000 middle-skills workers is expected, which is nearly 14 percent of the overall projected shortfall.[29] In contrast, some estimates suggest that by 2032, there will be a surplus of workers with a high school education and no additional job-related skills or training.[30] This pattern suggests that there will be a pool of individuals in need of work but also in need of the relevant education to meet the job requirements of available positions.

In recent years, lawmakers have increasingly focused on expanding middle-skills pathways—training and certifications that fall between a high school diploma and a four-year degree.

Expanding Middle-Skills Pathways

In recent years, lawmakers have increasingly focused on expanding middle-skills pathways—training and certifications that fall between a high school diploma and a four-year degree.[31] This focus reflects both growing workforce demands and the recognition that these pathways offer accessible routes to economic mobility, particularly for populations historically underrepresented in higher education. These types of programs include state-authorized apprenticeships and licenses, trade schools, community college programs, and, sometimes, unregulated education.[32] In the United States, more than 330,000 unique employment credentials exist; these may be duplicative, cumulative, or complementary.[33]

Growing Workforce Demand

Forty years ago, approximately two-thirds of U.S. jobs required only a high school diploma. Today, the opposite is true, and about 68 percent of jobs require training beyond high school.[34] Most of these—about one-half of all U.S. jobs—require some additional training or education beyond high school but not a four-year degree.[35] In other words, roughly 50 percent of all U.S. jobs are currently middle-skills positions.

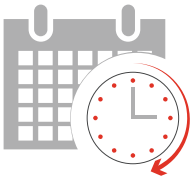
These types of jobs also represent a growing portion of the labor market. One state report estimated that 69 percent of its projected job openings in key industries

would require additional skills training beyond a high school diploma.[36] This estimate translated into a need to upskill or reskill 82,000 workers annually in that one state alone.[37] In addition, almost every U.S. state has set or is in the process of setting a goal to increase its population's postsecondary skills. These types of goals generally call for at least 55 percent of the states' residents to hold some type of post-high school education or training. Alabama illustrates this trend, having set a goal of adding 500,000 skilled workers to its workforce by 2025.[38] They met 97.6 percent of that target, adding 487,937 newly skilled workers, more than 150,000 of whom obtained middle-skills training or credentials.[39]

Enhancing Economic Mobility

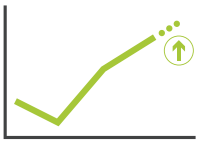
As the need for middle-skills jobs continues to grow, pathways for accessing the necessary skills have become an increasingly important factor for fostering economic mobility because these programs are more accessible than four-year degree programs and offer a strong return on investment for workers.

- **Accessible entry points.** Many people do not have the time, financial resources, or desire to pursue a college or university degree.[40] In addition, the attainment of traditional four-year degrees and the acquisition of student loan burdens—as well as the ability to shoulder these debts—remain stratified by race, income, and gender.[41] For example, recent federal data show that white and Asian students complete bachelor's degrees at substantially higher rates than Black and Hispanic students.[42] In addition, individuals from higher-income families or those with a parent who holds a four-year degree are more likely to graduate than first-generation or low-income peers.[43] Research also documents that Black borrowers are more likely to take on larger student loans and experience greater repayment difficulties than white borrowers at similar income levels.[44] Together, these factors contribute to enduring racial disparities in wealth and economic mobility.

  Because middle-skills training programs are often shorter term and lower cost than four-year degrees, especially with recent government investments such as those described below, they are particularly appealing to and offer more accessible entry points for groups that have historically struggled to access education and advancement opportunities.[45] Consequently, women and Black workers are more likely than men and white workers to hold certifications, particularly in health-related fields.[46]

- **Strong economic returns.** Middle-skills credentials can deliver consistently strong economic returns. Studies suggest that full-time employees who have non-degree credentials earn more in the same positions than those lacking credentials.[47] In fact, workers with postsecondary credentials earn 30 percent more on average than those who have only a high school diploma.[48] Moreover, some middle-skills workers like mechanics, construction supervisors, and web developers earn wages comparable to college graduates.[49] These annual earnings can translate into long-term gains: Completing a registered apprenticeship can result in an additional $300,000 earned (wages and benefits) over a person's lifetime.[50] Additionally, those who have completed these types of programs have an 8.6 percent higher employment rate than non-credentialed workers.[51]

It is, however, important to note that not all middle-skills positions pay well. Some credentialed positions, such as caregiving professions like childcare assistants and home health aides, typically offer wages below general market averages.[52] Yet even in these fields, workers earn notably more after receiving credentials.[53] For example, Californians who received a certificate in Administrative Medical Assisting earned $25,606 two years after earning that credential. Although this salary is lower than average earnings for the general population in the relevant age group holding a high school diploma, it is much higher than it was before enrolling in the certificate program ($14,894).[54]

Investing in Workforce Development

The gap between workforce demand and current credential attainment has driven significant public investment in training programs.

Labor shortages can strain service delivery, reduce goods availability, delay business operations, and create inflationary pressures—effects that extend across healthcare, manufacturing, and other critical sectors.[55] These workforce pressures have prompted policymakers to prioritize expanding access to middle-skills credentials. The need is urgent: Fewer than half of Americans hold credentials beyond high school, and, in some states, this number falls below 40 percent.[56] This gap between workforce demand and current credential attainment has driven significant public investment in these types of training programs.

At the federal level, the most recent effort is the Bipartisan Workforce Pell Act, a $65 million grant that passed as part of President Donald J. Trump's One Big Beautiful Bill Act.[57] This grant funds support programs that help community colleges develop training programs for in-demand occupations.[58] To be eligible for the grant, programs must provide education that is aligned with high-skill, high-wage, or in-demand industries.[59] Workforce Pell Grants will begin July 1, 2026, and are for students enrolled in short-term credential programs for professions such as emergency medical technicians and automotive technicians. Additionally, programs can only receive this funding if they meet specific performance benchmarks, like having a 70 percent or greater completion rate and job placement rate.[60] The Department of Education asserts that this grant will, "help fill the growing skills-gap and labor shortage [and] create a stronger talent pipeline for our nation's workforce."[61]

Before this legislation, only low-income students pursuing a typical four-year degree program were eligible for Pell Grants; they were not designed to support workforce expansion or middle-skills job training. This inhibited pathways to many high-quality, short-term training programs for in-demand jobs (e.g., skilled trades like electricians or solar installation technicians), leading to fewer students pursuing those industries and potentially contributing to ongoing labor shortages.[62] The Workforce Pell Grant program targets a different population of students: anyone without a graduate degree looking to develop specific skills. This broader eligibility requirement is expected to give new workers as well as low-income workers specialized expertise and improved access to better jobs.[63]

The federal government has also invested considerably in workforce-specific training through more than $86 million in industry-targeted grant programs distributed to 14 states in September 2025.[64] Award recipients are operating programs that focus on "training and retraining newly hired and incumbent workers in high-growth and emerging industries critical to American competitiveness." These programs training for jobs in manufacturing, construction, aerospace, health care, and more.[65]

Additionally, states are directly investing in their specific workforce needs, with a growing focus on preparing residents for middle-skills jobs.[66] For example, Indiana and Louisiana have been supporting students in skilled, non-degree certification-training programs for several years. The focus of these programs is often on emerging technologies and high-demand skills, from carpentry and plumbing to aviation maintenance and the health sciences.[67] Michigan has allocated funds enabling adult students without postsecondary credentials to attend community college at no cost.[68] In December 2025, Virginia announced a plan to invest $6.2 million in workforce development programs targeting skilled trades, technology, aviation, and small business growth.[69] Many states with large rural populations are leveraging the Rural Health Transformation Program, which provides funding and policy flexibility to strengthen local healthcare delivery systems and expand healthcare workforce capacity beyond traditional degree pipelines.[70] A central strategy for these states has been investing in community health workers—a category of middle-skills employees who serve as trusted connectors between clinical systems and communities.[71]

A central strategy for some states has been investing in community health workers—a category of middle-skills employees who serve as trusted connectors between clinical systems and communities.

Conclusion

As industries grapple with ongoing labor shortages and the projected increase in need for middle-skills workers, lawmakers have supported programs that provide training and credentials for these non-degree positions.[72] These investments will help solve current labor shortages, prevent future shortages, and unlock economic opportunities for individuals who have historically been excluded from post-secondary education.[73]

However, as these investments grow, lawmakers will need to consider how the broader policy landscape—especially state occupational licensing requirements—affects who can access these pathways. Forthcoming R Street analyses will examine occupational licensing policy in specific middle-skills fields, evaluating the evidence on licensing's impacts and identifying when reform may be warranted to better align quality assurance with accessible pathways to opportunity.

About the Authors

- **Stacey McKenna** is a resident senior fellow and associate director in the Healthier Communities policy program at the R Street Institute. Her research and writing focus on the ways that policy affects people's ability to protect their health and build thriving families and communities.
- **Courtney Joslin** is a resident fellow and senior manager in the Healthier Communities policy program at the R Street Institute. Her focus is on how public policy can improve women's healthcare access and economic mobility.
- **Lindsay Heck** is a research assistant in the Healthier Communities policy program at the R Street Institute. She conducts research and writes on policy related to women and children's health and well-being.
- **Jay Bell** is a research assistant in the Healthier Communities policy program at the R Street Institute through the Koch Internship Program.

This report was made possible through the support of Lumina Foundation. The views expressed are those of the authors and do not necessarily reflect those of Lumina.

Endnotes

1. Lindsay Burton and Stephanie Ferguson Melhorn, "Understanding America's Labor Shortage: The Most Impacted States," U.S. Chamber of Commerce, Dec. 13, 2024. https://www.uschamber.com/workforce/the-states-suffering-most-from-the-labor-shortage.
2. Zachary Mabel et al., "Missed Opportunities: Credential Shortages in Programs Aligned with High-Paying Middle-Skills Jobs in 55 US Metro Areas," Georgetown University Center on Education and the Workforce, 2024. https://cew.georgetown.edu/cew-reports/high-paying-middle-skills; "The Skills Mismatch," National Skills Coalition, last accessed April 1, 2026. https://nationalskillscoalition.org/skills-mismatch.
3. Ben Armstrong and Elisabeth Reynolds, "Growing from the middle out: An economic model of good jobs for the heartland, by the heartland," Brookings, April 21, 2025. https://www.brookings.edu/articles/growing-from-the-middle-out-an-economic-model-of-good-jobs-for-the-heartland-by-the-heartland.
4. Veronica Goodman et al., "Workforce Development State Strategies: A 50-State Scan of Best Practices From Recent Action," Center for American Progress, Oct. 31, 2024. https://www.americanprogress.org/article/workforce-development-state-strategies-a-50-state-scan-of-best-practices-from-recent-action.
5. Carolyn M. Veneri, "Can occupational labor shortages be identified using available data?," *Monthly Labor Review* 122:3 (March 1999), p. 15. https://www.bls.gov/opub/mlr/1999/03/art2full.pdf.
6. Ibid.
7. Stephanie Ferguson Melhorn, "Understanding America's Labor Shortage," U.S. Chamber of Commerce, Nov. 21, 2023. https://www.uschamber.com/workforce/understanding-americas-labor-shortage; Carlo Pizzinelli and Ippei Shibata, "Has COVID-19 induced labor market mismatch? Evidence from the US and the UK," *Labour Economics* 81 (Jan. 10, 2023). https://pmc.ncbi.nlm.nih.gov/articles/PMC9830905.
8. Kyla F. Woodward et al., "Beyond the pandemic: the relationship between macroeconomic conditions and healthcare worker shortages in the United States," *BMC Health Services Research* 25 (May 2, 2025). https://pmc.ncbi.nlm.nih.gov/articles/PMC12046679; Roy Maurer, "US Labor Shortage: Who Will Do the Work," SHRM, July 1, 2025. https://www.shrm.org/topics-tools/news/hr-quarterly/us-labor-shortage-looms-who-will-do-work; Heidi Shierholz, "Labor force participation," Economic Policy Institute, May 24, 2012. https://epi.org/publication/ib333-labor-force-participation-since-great-recession.
9. Roy Maurer, "US Labor Shortage: Who Will Do the Work?," SHRM, July 1, 2025. https://www.shrm.org/topics-tools/news/hr-quarterly/us-labor-shortage-looms-who-will-do-work; Dorina Georgieva, "What do demographic changes mean for labor supply?," World Bank Blogs, April 9, 2024. https://blogs.worldbank.org/en/developmenttalk/what-do-demographic-changes-mean-for-labor-supply-; Rachel Walsh, "Does the U.S. Have a Fertility Crisis?," Johns Hopkins Bloomberg School of Public Health, Jan. 6, 2026. https://publichealth.jhu.edu/2026/is-the-us-birth-rate-declining.
10. Douglas Clement, "Has the U.S. economy stagnated because its workforce aged?," Federal Reserve Bank of Minneapolis, April 23, 2019. https://www.minneapolisfed.org/article/2019/has-the-us-economy-stagnated-because-its-work-force-aged.
11. Georgieva. https://blogs.worldbank.org/en/developmenttalk/what-do-demographic-changes-mean-for-labor-supply-.
12. Stuart Anderson, "Trump And Miller Slashing Legal Immigration By 33% To 50%," *Forbes*, Jan. 20, 2026. https://www.forbes.com/sites/stuartanderson/2026/01/20/trump-and-miller-slashing-legal-immigration-by-33-to-50.
13. U.S. Bureau of Labor Statistics, "Foreign-Born Workers: Labor Force Characteristics — 2024," May 20, 2025. https://www.bls.gov/news.release/pdf/forbrn.pdf; William H. Frey, "Reduced immigration slowed population growth for the nation and most states, new census data show," Brookings, Feb. 11, 2026. https://www.brookings.edu/articles/reduced-immigration-slowed-population-growth-for-the-nation-and-most-states-new-census-data-show.
14. Ibid.
15. Anna Shepperson, "Immigrants Are Key to Filling US Labor Shortages, New Data Finds," American Immigration Council, July 2, 2024. https://www.americanimmigrationcouncil.org/blog/immigrants-fill-us-labor-shortages-map-the-impact.
16. International Labour Organization, "What is skills mismatch, and why should we care?," International Labour Organization, April 1, 2020. https://www.ilo.org/resource/article/what-skills-mismatch-and-why-should-we-care.
17. Alicia Sasser Modestino, "The Importance of Middle-Skill Jobs," *Issues in Science and Technology* 33:1 (Fall 2016). https://issues.org/the-importance-of-middle-skill-jobs; Jeff Strohl et al., "The Great Misalignment: Addressing the Mismatch between the Supply of Certificates and Associate's Degrees and the Future Demand for Workers in 565 US Labor Markets," Georgetown University Center on Education and the Workforce, 2024. https://cew.georgetown.edu/cew-reports/greatmisalignment.
18. Ibid.
19. Linda Koopmans et al., "Long-term effects of on-the-job skills (mis)match on employee wellbeing and employability: a 7-wave longitudinal study," *Frontiers in Psychology* 16 (Dec. 17, 2025). https://pmc.ncbi.nlm.nih.gov/articles/PMC12753319.
20. "Occupational Licensing Final Report: Assessing State Policies and Practices," National Conference of State Legislatures, Dec. 4, 2020. https://www.ncsl.org/labor-and-employment/occupational-licensing-final-report.
21. Nicholas A. Carollo et al., "The Origins and Evolution of Occupational Licensing in the United States," National Bureau of Economic Research, March 2025. https://www.nber.org/system/files/working_papers/w33580/w33580.pdf; Andrew Wimer, "New Study Reveals Most Government Studies Find New Licenses Unnecessary," Institute for Justice, Feb. 24, 2022. https://ij.org/press-release/new-study-reveals-most-government-studies-find-new-licenses-unnecessary.
22. Kennon Bacon and Massimiliano Tani, "Occupational Licensing and Skills Mismatches," The Center for Growth and Opportunity at Utah State University, November 2020. https://www.thecgo.org/wp-content/uploads/2020/11/Occupational-Licensing-and-Skills-Mismatches.pdf.
23. Nicole Smith et al., "Falling Behind: How Skills Shortages Threaten Future Jobs," Georgetown University Center on Education and the Workforce, 2025. https://cew.georgetown.edu/wp-content/uploads/cew-falling_behind-fr.pdf; Ron Hetrick et al., "Demographic Drought: The Rising Storm—Building a Future-Ready Workforce to Withstand the Looming Labor Shortage," Lightcast, 2024. https://www.datocms-assets.com/62658/1726526804-the_rising_storm_lightcast_final.pdf.
24. Smith et al. https://cew.georgetown.edu/wp-content/uploads/cew-falling_behind-fr.pdf; Stephanie Ferguson Melhorn and Makinizi Hoover, "Understanding America's Labor Shortage: The Most Impacted Industries," U.S. Chamber of Commerce, Feb. 20, 2026. https://www.uschamber.com/workforce/understanding-americas-labor-shortage-the-most-impacted-industries; Jack Malde and Theresa Cardinal Brown, "Bridging the Gap: Meeting Workforce Needs Over the Next Decade," Bipartisan Policy Center, April 2, 2025. https://bipartisanpolicy.org/report/bridging-the-gap-meeting-workforce-needs-over-the-next-decade; "Bipartisan Policy Center Unveils New Report Addressing U.S. Workforce Shortages Over the Next Decade," Bipartisan Policy Center, April 10, 2025. https://bipartisanpolicy.org/press-release/workforce-gaps.
25. Smith et al., "Falling Behind: How Skills Shortages Threaten Future Jobs." https://cew.georgetown.edu/wp-content/uploads/cew-falling_behind-fr.pdf.
26. "Indiana's Workforce Transformation: Understanding the Need for Upskilling and Reskilling in a Changing Economy," Ivy Tech Community College and TEConomy Partners, April 2025. https://www.ivytech.edu/media/gl0p4xgx/white-paper-indiana-s-workforce-transformation.pdf.
27. Smith et al., "Falling Behind: How Skills Shortages Threaten Future Jobs." https://cew.georgetown.edu/wp-content/uploads/cew-falling_behind-fr.pdf.
28. Elizabeth Guevara, "These Grad Degrees Aren't Considered 'Professional'—Limiting Student Loans," Investopedia, Dec. 2, 2025. https://www.investopedia.com/these-graduate-degrees-aren-t-considered-professional-how-that-limits-access-to-student-loans-11860599; "Department of Education Proposal Still Excludes Nursing from 'Professional Degree' Definition," The American Nurses Association, Feb. 3, 2026. https://www.nursingworld.org/news/news-releases/2026-news-releases/department-of-education-proposal-still-excludes-nursing-from-professional-degree-definition.
29. Smith et al. https://cew.georgetown.edu/wp-content/uploads/cew-falling_behind-fr.pdf.
30. Ibid.

31. Amy Ellen Duke-Benfield et al., "Expanding Opportunities: Defining Quality Non-Degree Credentials for States," National Skills Coalition, September 2019. https://files.eric.ed.gov/fulltext/ED603280.pdf.
32. Jenna Leventoff, "Measuring Non-Degree Credential Attainment: 50-State Scan," May 2018. https://files.eric.ed.gov/fulltext/ED603101.pdf.
33. Duke-Benfield et al. https://files.eric.ed.gov/fulltext/ED603280.pdf.
34. Emma Gallegos, "Report: 72% of jobs will require more than a high school diploma in 2031," EdSource, Nov. 16, 2023. https://edsource.org/updates/report-72-of-jobs-will-require-more-than-a-high-school-diploma-in-2031.
35. "The Skills Mismatch." https://nationalskillscoalition.org/skills-mismatch.
36. "Indiana's Workforce Transformation: Understanding the Need for Upskilling and Reskilling in a Changing Economy." https://www.ivytech.edu/media/gl0p4xgx/white-paper-indiana-s-workforce-transformation.pdf.
37. Ibid.
38. Trisha Powell Crain, "Alabama nears 500,000 credential goal as Success Plus deadline passes quietly," *Alabama Daily News,* Dec. 19, 2025. https://aldailynews.com/alabama-nears-500000-credential-goal-as-success-plus-deadline-passes-quietly.
39. Ibid.
40. Michelle Van Noy, "A Primer on Noncredit and Non-Degree Credentials," Education and Employment Research Center, Rutgers University, June 2023. https://noncreditresearch.org/wp-content/uploads/2023/10/A-Primer-on-Noncredit-and-Non-degree-Credentials-ECMC-EERC-8.2023.pdf.
41. Ibid.
42. Ibid.
43. Ibid.
44. Fenaba R. Addo, "Middle-class attainment in young adulthood: higher education, student debt, and racial wealth inequality," *Oxford Review of Economic Policy* 40:3 (Autumn 2024), pp. 518-529. https://doi.org/10.1093/oxrep/grae028.
45. National Center for Education Statistics, "Degrees Conferred by Race/Ethnicity and Sex," U.S. Department of Education, 2024. https://nces.ed.gov/fastfacts/display.asp?id=72.
46. Anthony P. Carnevale et al., "Learning and Earning by Degrees: Gains in College Degree Attainment Have Enriched the Nation and Every State, but Racial and Gender Inequality Persists," Georgetown University McCourt School of Public Policy, 2024. https://cew.georgetown.edu/wp-content/uploads/CEW-attainment-gains-full_report.pdf.
47. Anthony P. Carnevale et al., "Certificates: Gateway to Gainful Employment and College Degrees," Georgetown University Center on Education and the Workforce, June 2012. https://cew.georgetown.edu/wp-content/uploads/2014/11/Certificates.FullReport.061812.pdf; Stephanie Ewert and Robert Kominski, "Measuring Alternative Educational Credentials: 2012," U.S. Census Bureau, January 2014. https://www2.census.gov/library/publications/2014/demographics/p70-138.pdf.
48. Carnevale et al., "Certificates: Gateway to Gainful Employment and College Degrees." https://cew.georgetown.edu/wp-content/uploads/2014/11/Certificates.FullReport.061812.pdf.
49. Ibid.; Ewert and Kominski. https://www2.census.gov/library/publications/2014/demographics/p70-138.pdf; Sara Weissman, "Too Many Well-Paid Middle-Skills Jobs, Not Enough Credentials," Inside Higher Ed, June 24, 2025. https://www.insidehighered.com/news/student-success/life-after-college/2025/06/24/gap-between-well-paid-middle-skills-credentials.
50. Debbie Reed et al., "An Effectiveness Assessment and Cost-Benefit Analysis of Registered Apprenticeship in 10 States," U.S. Department of Labor, July 25, 2012. https://www.dol.gov/sites/dolgov/files/ETA/publications/ETAOP_2012_10.pdf.
51. Ibid.
52. Duke-Benfield et al. https://files.eric.ed.gov/fulltext/ED603280.pdf.
53. Ibid.
54. Ibid.
55. Makinizi Hoover et al., "Data Deep Dive: A National Nursing Crisis," U.S. Chamber of Commerce, Jan. 29, 2024. https://www.uschamber.com/workforce/nursing-workforce-data-center-a-national-nursing-crisis; Steven Zahniser et al., "Farm Labor Markets in the United States and Mexico Pose Challenges for U.S. Agriculture," U.S. Department of Agriculture, November 2018. https://www.ncaeonline.org/wp-content/uploads/2021/03/Zahniser-et-al.-2018-Farm-Labor-in-the-U.S.-and-Mexico-Pose-Challenges-for-U.S.-Agriculture.pdf; Ibrahim Osman and Hossein Ataei, "Addressing the Skilled Labor Shortage: Impacts and Solutions in the Postpandemic Construction Industry," *Journal of Legal Affairs and Dispute Resolution in Engineering and Construction* 18:1 (Sept. 29, 2025). https://ascelibrary.org/doi/10.1061/JLADAH.LADR-1299; Darrell M. West, "The Paradox of Worker Shortages at a Time of High National Unemployment," Brookings, April 10, 2013. https://www.brookings.edu/articles/the-paradox-of-worker-shortages-at-a-time-of-high-national-unemployment; Orsetta Causa et al., "Labour shortages and labour market inequalities: evidence and policy implications," Organisation for Economic Co-operation and Development, March 21, 2025. https://www.oecd.org/en/publications/labour-shortages-and-labour-market-inequalities_14e62ec0-en.html.
56. "Indiana's Workforce Transformation: Understanding the Need for Upskilling and Reskilling in a Changing Economy." https://www.ivytech.edu/media/gl0p4xgx/white-paper-indiana-s-workforce-transformation.pdf.
57. "US Department of Labor Announces Availability of $65M in Grants to Help Community Colleges Increase Access to In-Demand, High-Quality Training," U.S. Department of Labor, Feb. 17, 2026. https://www.dol.gov/newsroom/releases/eta/eta20260217; Emily Brooks and Alex Gangitano, "White House pushes Republicans on 'big, beautiful' tax cut bill rebrand," *The Hill*, Sept. 3, 2025. https://thehill.com/homenews/house/5483842-trump-tax-cut-rebranding-strategy.
58. "US Department of Labor Announces Availability of $65M in Grants to Help Community Colleges Increase Access to In-Demand, High-Quality Training." https://www.dol.gov/newsroom/releases/eta/eta20260217.
59. Committee on Education & the Workforce, "Bipartisan Workforce Pell Act: Section by Section Summary," U.S. House of Representatives, last accessed March 2, 2026. https://edworkforce.house.gov/uploadedfiles/bipartisan_workforce_pell_act_section_by_section_final.pdf.
60. "Workforce Pell Grant Program," State Board for Community and Technical Colleges, last accessed March 2, 2026. https://www.sbctc.edu/colleges-staff/programs-services/student-services/workforce-pell.
61. "U.S. Department of Education Concludes Negotiated Rulemaking Session to Implement the New Workforce Pell Grant Program," U.S. Department of Education, Dec. 12, 2025. https://www.ed.gov/about/news/press-release/us-department-of-education-concludes-negotiated-rulemaking-session-implement-new-workforce-pell-grant-program.
62. Jobs for the Future, "Budget Bill Expands Pell Eligibility: What's Next for Students and Providers?," Jobs for the Future, July 3, 2025. https://www.jff.org/blog/budget-bill-expands-pell-eligibility-whats-next-for-students-and-providers; Ben Brubeck, "Analysis of Workforce Pell Grant Expansion in the Budget Reconciliation Law," July 8, 2025. https://pccaweb.org/images/stories/pdf/Memo_to_PCCA_Re_Workforce_Pell_Language_in_OBBBA_070825.pdf; Jenn Holcomb, "How Workforce Pell Opens New Pathways for Careers in the Skilled Trades," Interplay Learning, Feb. 4, 2026. https://www.interplaylearning.com/blog/how-workforce-pell-opens-new-pathways-for-careers-in-the-skilled-trades.
63. Roy Maurer, "Workforce Pell Grants Become a Reality," SHRM, Aug. 14, 2025. https://www.shrm.org/topics-tools/news/organizational-employee-development/workforce-pell-grants-become-a-reality.
64. "US Department of Labor Awards $86 Million to 14 States for Investment in Skills Training Programs for Critical In-Demand, Emerging Industries," U.S. Department of Labor, Sept. 30, 2025. https://www.dol.gov/newsroom/releases/eta/eta20250930.

65. Ibid.
66. "State Approaches to Nondegree Credentials," National Conference of State Legislatures, April 20, 2023. https://www.ncsl.org/education/state-approaches-to-nondegree-credentials.
67. Tyler Thrasher, "$6.2M in new Virginia funding aims to train workers for trades, tech and aviation jobs," FOX 5 DC, Dec. 30, 2025. https://www.fox5dc.com/news/6-2m-new-virginia-funding-aims-train-workers-trades-tech-aviation-jobs.
68. Goodman et al. https://www.americanprogress.org/article/workforce-development-state-strategies-a-50-state-scan-of-best-practices-from-recent-action.
69. Thrasher. https://www.fox5dc.com/news/6-2m-new-virginia-funding-aims-train-workers-trades-tech-aviation-jobs.
70. Megan D'Alessandro and Sandra Wilkniss, "Rural Health Transformation Program: State Focus on Community Health Workers," National Academy for State Health Policy, Feb. 23, 2026. https://nashp.org/rural-health-transformation-program-state-focus-on-community-health-workers.
71. Ibid.
72. Burton and Ferguson Melhorn, "Understanding America's Labor Shortage: The Most Impacted States." https://www.uschamber.com/workforce/the-states-suffering-most-from-the-labor-shortage; Mabel et al. https://cew.georgetown.edu/cew-reports/high-paying-middle-skills; Armstrong and Reynolds. https://www.brookings.edu/articles/growing-from-the-middle-out-an-economic-model-of-good-jobs-for-the-heartland-by-the-heartland.
73. Goodman et al. https://www.americanprogress.org/article/workforce-development-state-strategies-a-50-state-scan-of-best-practices-from-recent-action.