



2021 Workforce Policy Recommendation Reimagining Education Models to Train Workers for 21st Century Skills

Summary

Employers, including the US Federal Government,¹ increasingly value worker skills over degrees for the digital jobs that currently go unfilled due to lack of qualified candidates. As college graduates with student loan debt struggle to find jobs, educators must abandon past assumptions that college is the only route for every person and reimagine training models that lead to engaging, well-paying, 21st century jobs. Additionally, as noted by Sunand Bhattacharya, Global Education Strategist for the Autodesk Education Experience Group, today's youth are already technically literate, having been raised on "apps" and similar technologies, and are ahead of higher education in learning technical and digital literacies, which could cause future workforce participants to skip higher education altogether.² And as rising numbers of current workers lose jobs to automation, artificial intelligence and other rapidly developing technologies, investing in rapid prototyping of technology education, training and upskilling programs to keep pace with rapidly developing technologies, becomes increasingly important.³ Unfortunately many education providers and industry employers do not recognize the next generation of technical and digital literacies, if not acquired through traditional educational institutions, pathways or credentials.

We propose that the new administration implement a two-pronged approach to resolving the education disconnect with regards to essential digital and technical skills by (1) integrating and building upon micro-certifications and certificates such that they can be broadly accessed across the country, and broadly recognized and supported by industry, and (2) updating successful apprenticeship and pre-apprenticeship programs to recognize and incorporate digital literacies for disruptive technologies such as 3D Printing, robotics, and generative design, while integrating related micro-credentialing and certifications into apprenticeship programs.

Funding for the two pathways to reimagine and retool training models would not necessarily require additional funding, but rather the re-allocation and redirection of existing WIOA, Perkins V, and other funds.

¹ Darlene Superville, "Trump Wants Federal Hiring to Focus on Skills Over Degrees," *U.S. News and World Report*, (June 25, 2020), Associate Press Wire Service, <https://www.usnews.com/news/business/articles/2020-06-25/trump-wants-federal-hiring-to-focus-on-skills-over-degrees>.

² Sarah Boisvert, *The New Collar Workforce* (Pittsfield, MA: Photonics Media Press, 2018), 119.

³ Katherine Ash, and Madelyn Rahn, with Rachael Stephens, Martin Simon, Ivan Charner, Monika Aring, Larry Hulbert, Sherry Lassiter, and contributions from Sarah Boisvert, and Anna Waldman-Brown. *Reimagining Workforce Policy in the Age of Disruption: A State Guide to Preparing the Future Workforce Now*, (Washington, D.C: National Governors Association Center for Best Practices, 2020), 9. https://www.nga.org/wp-content/uploads/2020/07/State-Guide-for-Preparing-the-Future-Workforce_2020.pdf

Challenge and Opportunity

Disruptive technologies that were once the purview of manufacturing and high tech are now ubiquitous across industries. From healthcare to transportation and agriculture to retail, digital skills such as operating a 3D Printer in a hospital, repairing a robot in a warehouse or programming an autonomous vehicle are in high demand. While the World Economic Forum predicts that 75 million people worldwide will lose their jobs to automation by the year 2022, their research predicts that 133 million new digital jobs will be created during the same timeframe.⁴ As Walmart has expressed in our research, "Now that we are using janitorial robots, who is going to program, monitor and repair automation tools?"⁵ In addition to new hires with requisite job skills, incumbent workers must now be on an upskilling path via lifelong learning.

Prior to the Covid-19 pandemic, colleges and universities had already been experiencing declining enrollments. NPR reported in December of 2019 that all higher education institutions had seen an 11% decrease in full-time students since 2011.⁶ The pandemic only served to exacerbate the decline, drawing students to online learning at much lower fees than college tuition. Georgetown University's 2012 report "Certificates: Gateway to Gainful Employment and College Degrees" documents that in 1984 less than 2 percent of adults 18 and older had a certificate as their highest educational attainment; by 2009 the percentage had grown to almost 12 percent.⁷

The high unemployment rate in industries such as tourism, transportation, brick and mortar retail, and restaurants due to Covid-19 is also pushing displaced workers to seek re-skilling. As the Wall Street Journal reported in December of 2020, the re-opening of many of these businesses is in peril and especially in retail, may never return.⁸

Workforce and education policy must also stay up to date during these exponentially changing times. Policy makers must rethink assumptions, align policy with 21st century realities, and update opportunities so that everyone can have access to a well-paying, engaging job.

⁴ Centre for the New Economy and Society, *The Future of Jobs Report 2018* (Cologny/Geneva, Switzerland: World Economic Forum, 2018), viii, http://www3.weforum.org/docs/WEF_Future_of_Jobs_2018.pdf.

⁵ Walmart representative, in discussion with Sarah Boisvert, August 2019.

⁶ Meliisa Nadworny, and Max Larkin, "Fewer Students are Going to College. Here's Why That Matters," *Morning Edition*, (December 16, 2019), National Public Radio, <https://www.npr.org/2019/12/16/787909495/fewer-students-are-going-to-college-heres-why-that-matters>.

⁷ Anthony P. Carnevale, Stephen J. Rose and Andrew R. Hansen, *Certificates: Gateway to Gainful Employment and College Degrees*, (Washington, D.C.: Georgetown University Center on Education and the Workforce, June 2012), 4, <https://1gyhoq479ufd3yna29x7ubjn-wpengine.netdna-ssl.com/wp-content/uploads/2014/11/Certificates.FullReport.061812.pdf>.

⁸ Tamar Jacoby, "Helping Workers Displaced by the Covid-19 Economy," *Wall Street Journal*, (December 18, 2020), <https://www.wsj.com/articles/helping-workers-displaced-by-the-covid-19-economy-1160830253>.

Plan of Action

We propose updating and integrating, then building upon, two existing workforce training models to create a program for the digital world.

1. Micro-certifications and Certificates

Expansion of the availability and acceptance of micro-certifications and certificates requires a nationwide, coordinated effort for maximum impact.

- Micro-certifications such as the Fab Foundation's [Fab Academy](#), [New Collar Network digital badges](#) developed in collaboration with America Makes, and certificates such as those from MIT, Harvard, the Society of Manufacturing Engineers, IBM, and Autodesk that build current digital and technical skills must be readily available to today's workers. Short, affordable micro-certifications in new technologies such as robotics and 3D printing give students the flexibility needed to meet modern conditions and can be stacked into certificates that often lead to interest in gaining a college degree.

Of particular note, certificates and micro-credentials from Fab Academy and the New Collar Network's Digital Badges emphasize hands-on, Project-based Learning that fulfills employer needs for workers who possess problem-solving skills. Research with over 200 employers revealed that problem-solving is key to industry's competitive position on the international economic stage.⁹ Workforce training must then move to documenting the practical skills employers require over book learning and test-taking.

- Funding models on the Federal and State level need to encourage and incentivize the move to certificates. Current funding models often discourage institutions from moving to certificates. As an example, many community colleges are funded based upon the number of degrees granted in the previous year. Rather than tie funding to degrees, new metrics for success, such as jobs acquired, should be added to funding incentives. Naturally, there is little to be gained in implementing new, innovative programs in places where growing traditional programs is strongly incentivized. As outlined in the National Governors Association's state toolkit for preparing future workforce,¹⁰ federal policy makers must provide states with updated metrics of labor market success in order to better align resource allocation to meet needs of employers, workers, and training providers.
- Policymakers must continue the work of the White House Workforce Taskforce¹¹ to encourage employer acceptance of skills and competencies over degrees. This volunteer

⁹ Sarah Boisvert, *The New Collar Workforce* (Pittsfield, MA: Photonics Media Press, 2018), 53.

¹⁰ Katherine Ash, and Madelyn Rahn, with Rachael Stephens, Martin Simon, Ivan Charner, Monika Aring, Larry Hulbert, Sherry Lassiter, and contributions from Sarah Boisvert, and Anna Waldman-Brown, *Reimagining Workforce Policy in the Age of Disruption: A State Guide to Preparing the Future Workforce Now*, (Washington, D.C: National Governors Association Center for Best Practices, 2020), 30, https://www.nga.org/wp-content/uploads/2020/07/State-Guide-for-Preparing-the-Future-Workforce_2020.pdf.

¹¹ Darlene Superville, "Trump Wants Federal Hiring to Focus on Skills Over Degrees," *U.S. News and World Report*, (June 25, 2020), Associate Press Wire Service, <https://www.usnews.com/news/business/articles/2020-06-25/trump-wants-federal-hiring-to-focus-on-skills-over-degrees>.

organization led by IBM's Ginny Rometty and Apple's Tim Cook brings industry needs into focus for 21st century hiring practices.

- The above recommendations would not require an increase in spending but rather a re-direction and updating of current funding through WIOA, Perkins V, and other existing programs.

2. Apprenticeships and Pre-apprenticeships

The highly successful apprenticeship model needs to be updated for today's digital jobs and incorporate micro-certifications as its formal training component.

- Apprenticeships such as Fab Lab Hub's US Dept. of Labor registered apprenticeship for Additive Manufacturing [3D Printing] Technicians created in collaboration with IBM, Youngstown State University and the Urban Institute, need to be developed for other digital careers and integrate micro-certifications as the formal training component.
- Both workers and employers need to be educated on the benefits of apprenticeships including the availability of WIOA funding. Workforce Boards could be partners.
- Federal and State Departments of Labor need to update and simplify a cumbersome registration and reporting process for employers.
- Wrap-around services such as transportation and childcare must be included to ensure student success.
- Because there is already substantial WIOA funding in place, many of these programs would be a redirection of WIOA funds. Additionally redirected Perkins V funding for CTE, could support these new education pathways.

About the Authors

Sarah Boisvert, Ed.M., MBA, has spent 30-years in high tech manufacturing and workforce training, most recently as the Founder and CEO of Fab Lab Hub, LLC. Boisvert is the co-founder of Potomac Photonics, Inc. that invented and manufactured UV lasers [laser for LASIK eye surgery] and laser machine tools. Upon the sale of Potomac, Boisvert turned to national workforce issues and researched the employer requirements for manufacturing operators and technicians, jobs that often don't require a college degree. Her findings resulted in *The New Collar Workforce*, published by Photonics Media Press, and the development of New Collar digital badges in collaboration with America Makes that are issued by the non-profit New Collar Network, and form the education component of a US Dept. of Labor registered apprenticeship for additive manufacturing technicians. She is a Fellow and Past President of the Laser Institute of America and has served on the Boards of Directors of a wide range of manufacturing, science, and technology organizations. She has been quoted or interviewed by the BBC, the New York Times, the Washington Post, and the Wall Street Journal, among numerous media outlets.

Sherry Lassiter, Ed.M., is the President and CEO of the Fab Foundation, a non-profit committed to providing access to the tools, the knowledge and the means to educate, innovate and invent using technology and digital fabrication to allow anyone, to make (almost) anything and thereby creating opportunities to improve lives and livelihoods around the world. Leading the international Fab Lab Network of over 2000 facilities worldwide, Lassiter serves as Director of the International Fab Lab Outreach Program at MIT, is on the board of the Airbus Foundation and the Fab City Foundation and serves as advisor to the Museum of Science and Industry Chicago Innovation Committee and Maker's Asylum Mumbai Executive Steering Committee for STEAM School.

Both women worked on the National Governors Association "Future Workforce Now" project that resulted in a 2020 toolkit for states to drive meaningful change in workforce programs.

Addendum

FAQs

- Is there additional historical precedent or context that exists that this proposal builds on or refutes that one should be aware of?
 - For centuries, the apprenticeship and guild models worked exceedingly well until the last 30 years or so when college was seen as the path to economic stability. While it is true that college degree holders earn more than those with only a high school diploma, it is usually only so in STEM fields.¹²

- How much does the government spend on the particular policy issue currently? Are there historical precedents to demonstrate spending on the issue directly? If it is new, what other adjacent issues or policies could indirectly demonstrate spending?
 - The US Dept. of Labor's \$11 billion budget includes funding for WIOA projects which would be re-allocated to these policy recommendations. This includes expansion of the Apprenticeship programs already in place.

- Why should it be the federal government taking action on this issue vs. a state or local government? Or (if applicable) why not incentivize the private sector to address it directly?
 - Changing established, far-reaching mindsets can only be led on the national level.
 - Many private companies already implement workforce training programs such as certificates and apprenticeships but the efforts must be expanded to a wider range of industries beyond the trades.
 - Adoption and recognition of newer digital and technical literacies and competencies through certifications and apprenticeships, relevant to the rapid technology development of 21st century, needs national level support for scaling.

¹² Chris Seals, Shaina Hernandez and Tanya Terrell, *STEM Middle-Skill Career Pathways In The Baltimore Region*, (Baltimore, MD: Associated Black Charities and Greater Baltimore Committee, 2016), 7, <https://gbc.org/wp-content/uploads/2016/01/GBC-ABC-STEM-report-2016.pdf>.

- What does the issue look like in other countries that may impact a policymaker's perspective?
 - Many countries such as Japan and Germany have robust industry/education partnerships for non-college programs that are highly successful and been in place for centuries. In Germany in 2014 an estimated 60% of future workforce was engaged in apprenticeship training in advanced manufacturing, IT and hospitality, compared to approximately 5% in the US, and US apprenticeship participation at the time was largely in the construction trades.¹³

- What is the first step you suggest to get your proposal off the ground, and why start there?
 - Educate policy makers on the updates that need to be made to existing apprenticeship models for success in the 21st Century in order to ensure buy-in
 - Create podcast and/or webinar series to provide depth of understanding with interactive design thinking
 - Provide best practices currently found in numerous states
 - Research how new era intermediaries between employers and state Departments of Labor can be created in collaboration with IBM and Youngstown State University who have worked as an intermediary for additive manufacturing registered apprenticeships with the US Dept. Of Labor.

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¹³ Tamar Jacoby, "Why Germany Is So Much Better at Training Its Workers," *The Atlantic*, (October 16, 2014), <https://www.theatlantic.com/business/archive/2014/10/why-germany-is-so-much-better-at-training-its-workers/381550/>.