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Workforce Development & the Technological Frontier

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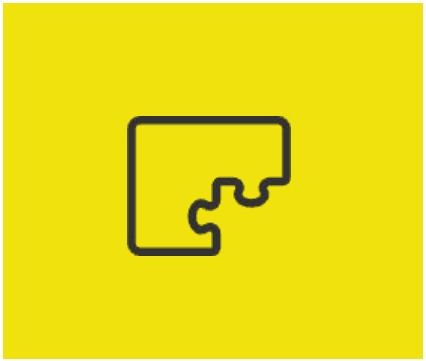
Workforce development:
private good or public good?

The Current Reality: Four Facts about U.S. Workforce Development

Persistently Underfunded

Spending < 0.1% of GDP on active labor market policies, second-to-last in OECD

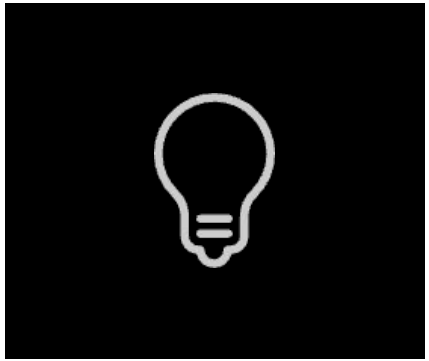


Highly fragmented

160+ federal programs; 7,000+ approved providers funded at average of $6000/provider

Legacy Paradigm

Silo'ed with four-year degrees, geared towards youth, limited work-based / mid-career



No incentive to innovate

Funding tied to enrollment volume, few resources to start or scale in high CapEx industries

The Opportunity for Workforce Development in the Age of AI

Competition with China

Bipartisan concerns about national security and defense industrial base

Industrial Resurgence

Large infrastructure investments for AI, chips, quantum, nuclear, etc.

Blue Collar Resilience

Production, maintenance, and construction jobs least exposed to AI displacement

Can this time be different from prior waves of technological change, when gains mostly accrued to the most educated Americans?

Evidence from Tech Hubs Competition

32 regional consortia selected from nearly 500 applicants by the U.S. Economic Development Administration's in 2023 for their potential to scale innovation and production and advance U.S. economic and national security interests.

Significant Opportunities w/out BA

Tech Hub applicants identified significant technician and operator roles essential to technology deployment and scale, often 40-75% of jobs

Skill resilience

Hands-on competencies like troubleshooting, calibrating, quality control, and problem-solving transfer across technologies and high-tech industries

High-return jobs

R&D and STEM-intensive industries offer higher paying jobs even for similarly educated workers and, generate large multiplier effects of job growth in other well-paying sectors like construction (Muro 2015)

Evidence from CHIPS & Science Key Technology Focus Areas

CHIPS & Science Focus Area	Competencies	Ex. Non-BA Pathway	Transferability
AI & Autonomy	Network/device monitoring	Data Center Operations Certificate	Comms/5G; Cyber; Robotics
Semiconductors	Clean room equipment; QC	Production Technician Certificate	Quantum; Materials; Energy
Quantum	Cryo environment; precision assembly	AAS, Optics Technology	Quantum; Materials; Energy
Robotics	Troubleshoot automated systems	AAS, Robotics	Energy; Semis; Cyber

A framework to understand jobs in a frontier economy

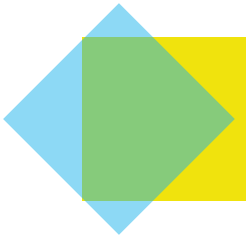
"Frontier Jobs"*	"Retooled Jobs"	"Legacy Jobs"
New Jobs, New Tasks	Old job, new tasks	Old job, high attrition
e.g. battery cell assembly technician; cryogenics tech for quantum	e.g. HVAC in semiconductor cleanroom; electricians in batteries	e.g. nuclear operators; tool & die makers

*Autor and Salomons 2022

→ Each job type may require different education models and investment strategies

Applying the R&D Lens to Three Job Archetypes

Category	Definition	Workforce Dev Implications	R&D funding model
Frontier Jobs	New occupations created by emerging technologies	May require developing new training programs from scratch	Seed funds and milestone-based payments
Retooled Jobs	Existing jobs with evolving tools, tasks, or settings	Need to update curricula and upskill incumbent workers	Rapid-response funds; matching incentives for employer investments in upskilling
Legacy Jobs	Established jobs with high replacement needs due to attrition	Scale proven models and ramp training proactively to preempt retirements	Multi-year core operating support for proven pipelines



Can public R&D provide an inspiration for a new generation for workforce development tools?

Appendix