

# From degrees to data: Transforming workforce development with a skills infrastructure

As state governments and universities tackle the Great Skills Reset, they're discovering that delivering skills-first requires becoming *data*-first.

## Why the skills gap isn't the real crisis

State governments, in partnership with higher education institutions, have long made workforce development a cornerstone of their strategies to strengthen regional economic vitality. These efforts, however, have been running headlong into the "Great Skills Reset," the tectonic shift in how work, skills, and careers are being defined in the GenAI era. The widening gap between the skills employers need and those the workforce possesses has become a major impediment to economic growth.

According to the World Economic Forum, nearly two-thirds of employers cite the skills gap as the largest obstacle to business transformation.<sup>1</sup> A recent State Higher Education Executive Officers (SHEEO) Association report revealed that economic and workforce development has returned as the top public policy issue heading into the 2026 state legislative sessions, with 97 percent of SHEEOs identifying it as important or very important.<sup>2</sup>

The problem is only worsening as the "demographic cliff" approaches. The Georgetown University Center on Education and the Workforce foresees a growing skills shortage in critical occupations as credentialed retirees outpace younger workers entering the labor market with comparable qualifications. It projects that through 2032, the US will need over 5 million additional workers with education and training beyond high school, 4.5 million of whom will need to hold at least a bachelor's degree.<sup>3</sup>

But while everyone's focused on the skills gap, they may be missing the real crisis: the skills *infrastructure* gap. Higher education has spent decades perfecting degree delivery, but most institutions currently lack the data architecture to translate learning into skills and verifiable, portable, machine-readable credentials that communicate those skills to employers and workforce development strategists.

The lack of a skills infrastructure means states can't see their skills supply, employers can't find verified talent, workers can't prove their capabilities, and educators can't identify the gaps they need to fill in their curricula. Despite mounting pressure on both states and educators to prove return on investment (ROI) on workforce investments and respond to rapidly changing employer needs, they're operating blindly with disconnected systems that can't track skills from classroom to career. Everyone's committed to *skills-first* transformation, but they're trying to build it on a transcript- and résumé-based system that makes true skills visibility impossible.

The winners in the Great Skills Reset won't be those with the best workforce development programs, they'll be those with the best data infrastructure to identify, track, and verify skills, aligning education, workforce, and industry systems to unlock job signals in real time in a form that states can use to inform their workforce development efforts, universities can use to keep pace with industry demands, employers can use as a trusted source of employee qualifications, and individuals can use to gain visibility into job opportunities and the path to eligibility for those jobs. Delivering *skills-first* requires becoming *data-first*.



<sup>1</sup> "The Future of Jobs Report 2025," The World Economic Forum, January 2025

<sup>2</sup> "Economic and workforce development, college affordability, top policy priorities for 2026," State Higher Education Executive Officers Association, January 13, 2026

<sup>3</sup> "Falling Behind: How Skills Shortages Threaten Future Jobs," Georgetown University Center on Education and the Workforce, 2025



## A paradigm shift

A skills infrastructure is not a new public-sector version of existing private-sector job boards—just another place for employers to post open positions and for prospective employees to post their résumés. In an already crowded sea of workforce technologies, from Learning and Employment Record (LER) systems to Applicant Tracking Systems (ATS), this is neither a replacement for existing platforms nor simply another ship in the water.

Instead, by underpinning the entire workforce development ecosystem with skills supply and demand data, a skills infrastructure changes the paradigm in the way employers, workers, educators, and state governments align to drive economic growth and increase employment opportunities more broadly.

As **Dr. Amanda Welsh**, director of the Workforce Development Laboratory at Northeastern University, explains,

**“By enabling job candidates to build verified skills profiles complete with project portfolios, assessments, and authenticated credentials, these platforms shift the hiring paradigm from *where* someone studied to *what* they can demonstrably do at any point in their career. Employers can evaluate candidates based on actual capabilities rather than degree or transcript proxies of those capabilities.”**

Equally transformative, these platforms function as demand-sensing systems. Degrees are lagging indicators; skills, on the other hand, are real-time signals. As Welsh points out, “Employer search patterns and skill prioritization generate real-time intelligence about evolving workforce needs. For educators and workforce development strategists, this creates a feedback loop where curriculum can align more dynamically with market signals, learner pathways can be optimized, and regional talent strategies can anticipate shifts before they register in lagging labor statistics.”

Beyond helping students obtain jobs and helping institutions better align curricula with industry skills requirements, a skills infrastructure can also help universities make the shift from four-year degree producers to lifelong learning institutions, where education becomes continuous and enduring rather than episodic.





## Protecting relevance

Despite the emergence of alternative learning pathways, higher education institutions remain the primary anchors for developing the highly skilled talent needed to meet today's challenges and seize tomorrow's opportunities. They will continue to be the crucibles of regional economic growth for the foreseeable future.

That relevance, however, cannot be taken for granted.

As we noted in "*It's time for the new 'New Education.'*" most colleges and universities would argue their mission is to prepare students for purposeful lives, not jobs. Yet the decision to pursue a four-year degree has always involved an implicit cost-benefit calculation: tuition today for higher earnings tomorrow. Increasingly, Americans are questioning that ROI.

And so are government leaders. There's growing pressure to show the economic impact of education spending. New federal mandates are tying funding to verifiable employment outcomes. Workforce Pell grants, for example, now require universities to demonstrate 70 percent job placement rates within 180 days of graduation.

As the Great Skills Reset continues to weaken the connection between a four-year degree and a stable, well-paying career, higher education institutions must adapt if they are to defend and demonstrate their value. States and universities are pursuing innovative workforce development strategies, including three-year degrees, embedded internships, and experiential learning. While these innovations may help address the skills gap, their potential impact is continually undermined by the lack of a skills data infrastructure.

A skills data infrastructure is a dynamic endeavor, and as much process as technology. It must continuously evolve with the skills marketplace to enable real-time changes to curricula. Its insights can also help transform the rigid vertical ladders of current degree programs into a more flexible and responsive cross-program matrix. If you can effectively distill courses down to the competencies they impart, you can easily identify multiple pathways to a skills-first degree, regardless of which programs offer each course.

Institutions that continue to emphasize static degree pathways and lack the agility to continually align curricula with rapidly changing employer and state economic development needs put their relevance at risk. Those that are unable to translate learning outcomes into granular, portable, verifiable skills profiles that employers can trust and easily integrate into hiring systems similarly are eroding their relevance and disadvantaging their graduates.





## Keeping pace with industry innovation cycles

Developing future-looking curricula is not without its challenges. It can easily devolve into a chicken-and-egg cycle, where students are unwilling to invest time and money in programs that develop skills without established career paths, and colleges and universities are unwilling to invest in programs that lack enrollment interest.

We have evidence that both educational institutions and students can and will respond with remarkable agility when the link between opportunity, investment, and outcome is clear. In January 2022, Intel committed \$17.7 million to Ohio colleges and launched training programs. Community colleges unveiled completed semiconductor certificate programs within 18 months of the announcement. Programs launching in 2023-2024 achieved strong enrollment because employment pathways were concrete rather than speculative.<sup>4,5</sup>

**A skills infrastructure is the key to scaling and sustaining this kind of success beyond a single large employer. By generating real-time demand signals across multiple industries based on granular skills rather than lagging proxies such as job titles or degree requirements, it can increase both the speed and fidelity of market insight and help overcome the chicken-and-egg challenge.**

<sup>4</sup> Shilov, A. "Semiconductor industry faces critical talent crisis — one million additional skilled workers needed by 2030," *Tom's Hardware*, June 26, 2025

<sup>5</sup> Camoin Associates, "Where the CHIPS Act is transforming the US semiconductor ecosystem," April 18, 2024



## A federated model

A skills infrastructure isn't a single, monolithic system. Instead, it's built on a federated network model, where multiple stakeholders in the ecosystem contribute data in the form of verified credentials, employment opportunities, or other related information such as demand forecasting, attrition prediction, and skills-gap modeling.

It's similar to the federated model of the internet. There is no one company or government providing "the internet." Instead, the internet allows literally anyone to participate, provided they deploy a server that follows the same technical standards as all other servers in the network.

An open, federated skills infrastructure would similarly allow organizations of different types and sizes to participate to form a network of independent stakeholders across the entire skills-tech ecosystem, including workforce development agencies, think tanks and consulting firms, education and training providers, digital wallet and credential management technologies, LER and ATS providers, recruiting firms, and online talent marketplaces and communities.

Interoperability and trust, therefore, are essential, and so beyond funding and evangelizing participation, a key role for state government is to provide standards and ongoing governance. Thankfully, the standards providers are already helping states with much of the burden.

In the same way the World Wide Web Consortium's (W3C) HTTP standard enabled the internet's explosive growth, newly defined standards are quickly forming the technical backbone for trusted, portable, machine-readable skills verification. The Open Badges v3 specification, for example, defines a global, interoperable format for digital credentials representing skills, competencies, certifications, and professional achievements aligned to the W3C Verifiable Credentials data model. The OpenID Connect for Verifiable Credential Issuance protocol enables universities, certification bodies, and workforce agencies to securely issue those credentials, including directly into individuals' digital wallets, and enables employers to trust their validity.

Multiple institutions are attempting to define taxonomies for how the skills themselves should be described, and therefore multiple competing "standards" may emerge. In a world where skills are evolving rapidly, these efforts may prove to be Sisyphean. But in our view, this isn't an obstacle. Commercial enterprises have for decades addressed differing data formats with extract, transform, and load (ETL) methods. Instead of forcing everyone into a single standard, ETL methods such as metadata easily enable interoperability, and they're an integral part of any well-designed data infrastructure.

# Transcripts to skills: The opportunity for universities to lead

While players across the skills-tech landscape will benefit from a skills infrastructure, universities are the natural first movers. Today's hiring paradigm relies heavily on candidates' self-reporting of their skills, a notoriously unreliable method. Historically, transcripts from educational institutions have been trusted by employers as a proxy for skills. However, the Great Skills Reset is rapidly eroding the adequacy of these credentials for that purpose.

By and large, employers are not interested in becoming skills verification organizations. Educational institutions, on the other hand, are exceedingly good at providing unbiased, critical evaluations of students. It's nothing new for them; it's what they've done for years as part of their grading, degree-awarding, and transcript-maintaining processes. The trust employers have in the evaluations colleges and universities make of their graduates can endure, but only if the credentials they issue evolve to provide the granularity of skill and capability information employers now require in a form they can trust and easily ingest.

Of course, the private sector is seeing opportunity here, too. Educational content and credentialing firms are building infrastructures designed to address the skills gap. ETS, the nonprofit organization known primarily for developing and administering standardized tests, for example, now offers skills-based assessment and credentialing solutions.

There are also several new skills-data companies that provide recruiters with detailed and searchable skills profiles of individuals. The challenge—and therefore the opportunity—is that all of these solutions are fragmented, stand-alone, and noninteroperable. Because educational institutions currently lack the data infrastructure to capture and communicate skills, these skills-data firms are largely using AI to “scrape” data from sources such as LinkedIn to build their profiles, which can lead to omissions and inaccuracies.

Universities, backed by state workforce development agencies, have a unique opportunity to bring order to the currently fragmented market. The trust employers have in a university's evaluation of prospective employees' skills can be a key propellant in the widespread adoption of interoperable skills infrastructures. A university system with an accessible, standards-based skills infrastructure will be an irresistible draw for industries desperate for those insights, offering a clear advantage to that institution's graduates.



## Conclusion

The Great Skills Reset isn't coming—it's here. States and their public universities that build interoperable skills data infrastructure together will lead the new economy. Those that remain siloed will watch their talent, employers, and relevance erode. Universities operating on transcript systems while states demand workforce outcomes are set up for mutual failure.

The choice is stark: continue managing 21st-century workforce challenges with disconnected 20th-century systems, or build the shared data-first foundation that helps make skills-first transformation real. The infrastructure that connects your campuses to careers, and education systems to economic development, determines whether your state and institutions thrive in the skills economy or get left behind managing the decline of the degree economy. The time for isolated pilots is over. The time for a connected, scalable skills infrastructure is now.



## How KPMG can help

KPMG LLP (KPMG) has the experience, resources, methodologies, and commitment required to help address the most complex challenges facing educational institutions today.

Our mission is to help colleges and universities thrive in the face of change, continuing to effectively serve the needs of society, strengthen their financial viability, enhance their brand, and improve the student, parent, faculty, and staff experience. We do this by helping institutions implement holistic, forward-looking strategies with the necessary people, process, and technology transformations to help them achieve a new level.

**We're experienced, nimble, and flexible.** We understand the unique issues, pressures, and challenges educational institutions face on the journey to digital transformation. We can meet you where you are on that journey and help advance your progress with no agenda other than to see you succeed. We can help you leverage the investments you've already made to help maximize their value.

**We offer clarity and insight.** As a trusted advisor, we can help you make sense of everything going on in the highly dynamic world of AI and other technologies that can impact your mission, from regulatory mandates and governance to emerging technologies. We can help align your efforts with leading practices from the private and public sectors, moving you forward quickly with confidence and conviction.



**We see the big picture.** We can help you anticipate and adapt to the wide-ranging impacts disruptive technologies such as AI can have on your organization, including budgets and financial controls, business processes and operating models, and employee growth and retention. We can help you understand your data, including where it comes from, what controls are required, how to maximize value locked in it, and how to share that value across organizations. We can help you harness the power of AI ethically and responsibly with trusted AI principles and governance models for managing risk.

**We can help you from strategy through implementation.** Unlike business-only consultancies, our more than 15,000 technology professionals have the resources, skills and experience, battle-tested tools and methodologies, and close alignment with leading technology providers to achieve your vision, quickly, efficiently, and reliably. And unlike technology-only firms, we have the business credentials, subject matter professionals, and public sector experience to help you deliver measurable business results.

# Contact us

Talk to us about how we can help your workforce development projects succeed.



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