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The Agile Community College:

Dynamic Labor Market Alignment in an AI-Driven Economy

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**THE PROJECT ON
WORKFORCE**

Education Design Lab

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About the Project on Workforce

The Project on Workforce is an interdisciplinary, collaborative project between the Harvard Kennedy School's Mossavar-Rahmani Center for Business and Government, the Harvard Business School Managing the Future of Work Project, and the Harvard Graduate School of Education. The Project produces and catalyzes basic and applied research at the intersection of education and labor markets for leaders in business, education, and policy. The Project's research aims to help shape a postsecondary system of the future that creates more and better pathways to economic mobility and forges smoother transitions between education and careers. Learn more at www.pw.hks.harvard.edu.

About Education Design Lab

Education Design Lab (Lab) is a national nonprofit that co-designs, prototypes, and tests education-to-workforce models through a human-centered design process focused on understanding learners' experiences, addressing equity gaps in higher education, and connecting learners to economic mobility. The Lab believes human-centered design allows colleges and universities to map and galvanize their existing strengths to meet the needs of the learners they serve. The Lab's process also shows higher education leaders how to consider the needs of employers, using the curriculum and program design as a gateway to make skills more visible to learners and employers alike.

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Executive Summary

The widespread adoption of generative artificial intelligence is transforming work at an unprecedented pace,¹ raising the stakes for community colleges as critical drivers of economic mobility.

Community colleges serve students seeking quality employment, employers seeking skilled talent, and regions seeking inclusive growth. Their position at the intersection of education, workforce development, and regional economic development places them at a critical juncture as communities navigate labor market change—but only if they can align with opportunity as conditions evolve.

Labor market alignment has long been a goal of workforce-focused community colleges, but traditional approaches are increasingly insufficient. They often treat the labor market as relatively static, rely heavily on lagging indicators, and position colleges as strictly responsive to employer demand rather than active shapers of regional opportunity. In an AI-driven economy, that posture is outdated. Colleges need an approach that allows them to detect change and adapt programs and partnerships and reallocate resources quickly. This playbook proposes two key concepts for community colleges to integrate into their operating models:

- **Dynamic labor market alignment is a goal:** Community colleges must be able to meet evolving workforce and learner needs by promoting access to quality jobs, skills that sustain individuals across long-lasting careers, and inclusive regional growth.
- **Institutional agility is the capability that makes dynamic alignment possible:** Colleges must have the systems-level capacity to detect, interpret, and respond quickly to labor market changes, while maintaining the quality and mission of the institution.

To operationalize this model, colleges need high-quality data and technology—and the systems and

processes to leverage them effectively. Building on a multi-year project that included case studies and design sprints with four diverse community colleges, **we put forth a data framework** that identifies the basic labor market data (current employment, job postings, and job projections) and student outcomes data (pathway engagement, employment, earnings, and mobility) colleges need to maintain dynamic labor market alignment. Our **technology framework** helps colleges evaluate and deploy tools that support five different capacities: teaching and learning; student support; career navigation; work-based learning; and employer partnerships.

The playbook applies these concepts and frameworks to four recurring institutional decisions, while highlighting examples of promising practices in action. Together, the decisions illustrate how dynamic alignment is not a periodic planning exercise. It is a continuous process that requires agile structures, shared data, dedicated resources, and college-wide practices.

1. **Program Portfolio — How do we shape a portfolio of programs?**
As colleges navigate competing stakeholder priorities and balance student interest, employer demand, and local labor market absorption, they can establish regular program review cycles, engage employers to validate current job demand for workers and anticipate skills requirements, and build dedicated analytic capacity to guide decisions about which programs to launch, expand, redesign, or sunset.
2. **Curriculum Design — How do we define what students learn?**
Programs must prepare students for long-term career mobility, while keeping pace with changing skill demands. Colleges can respond by leveraging labor market information to identify transferable skills across jobs,

systematizing employer partnerships, scaling work-based learning opportunities, and designing credentials that are stackable and portable.

3. Career Navigation — How do we help students make informed career decisions?

Colleges can make data available and user-friendly across the full student journey and equip career coaches with better data—strengthening proactive guidance and using technology tools to extend human support.

4. Resource Allocation — How do we allocate resources?

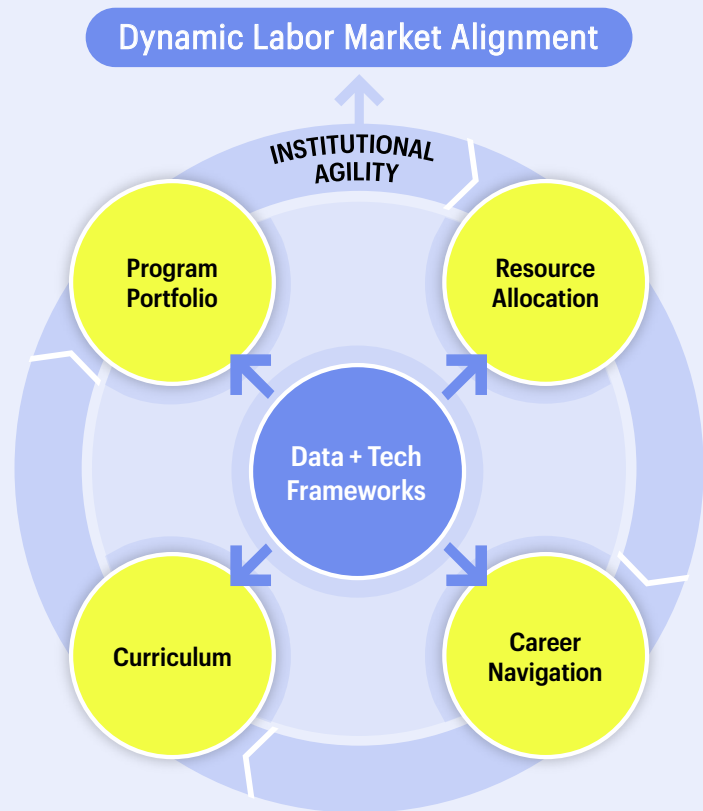
Despite confronting limited resources and competing demands, colleges can maximize the value of their investments by connecting program reviews to budgeting, evaluating pilot initiatives with clear criteria, and collaborating with partners to co-fund or share resources.

Robust institutional learning enables colleges to make strategic decisions as labor markets, technologies, and student needs change. Colleges can build this capacity by integrating data systems, improving data literacy, formalizing feedback loops, strengthening governance structures, and cultivating a data-driven culture.

Employers and policymakers are essential partners for colleges. For every decision, there is a distinct role for employers to play, from validating job demand to providing continuous feedback on graduate readiness. Policymakers can create economies of scale through shared data infrastructure and regional analytic capacity, as well as support innovation through flexible funding models.

The agile community college is not one that chases every labor market signal or adopts every new technology. **It is an institution that builds the capacity to adapt with purpose—helping students access quality jobs, employers find skilled talent, and regions build more inclusive and resilient economies.**

Figure ES-1: **New Model for Community Colleges in the GenAI Era**



Part 1: Introduction

Community colleges are being asked to prepare learners for a labor market that is changing faster than the systems built to support it historically.

Across the country, more than 1,000 community colleges serve approximately 10.6 million students each year—about 40% of all undergraduates—making these institutions central to both regional and national strategies to prepare the next generation of workers for technological and economic change.^{2,3}

Technology has long shaped patterns of work, but the pace, breadth, and unpredictability of current labor market change is unprecedented.⁴ The rise of artificial intelligence (AI), particularly generative AI, is both creating new economic opportunities and introducing new risks for workers, employers, and the institutions that connect them. For community colleges, adapting to technological disruption is becoming a necessary survival strategy and a core institutional responsibility.⁵ **This playbook offers a model to meet that workforce challenge** through data- and technology-enabled processes, structures, and partnerships that help colleges become more agile and aligned with the labor market.

Technology Reshaping the Workforce Landscape

Generative AI (genAI)—tools capable of producing text, code, images, and analysis at scale—represents a qualitatively new form of technological disruption. Unlike earlier waves of automation, which primarily affected routine, codifiable tasks, genAI disrupts knowledge work.⁶ Its diffusion has been rapid, with an overall adoption rate that surpasses both those reached by personal computers and the internet.⁷ As of May 2026, 62% of U.S. adults aged 18-64 report using genAI, with 45% of employed respondents using it at work.⁸ As it continues to be embedded across occupations

and industries—changing the configuration of work tasks and pathways—community colleges face a significant challenge: preparing graduates for a world with increasing volatility.

The introduction of agentic AI further complicates this picture. AI agents act as “tireless and knowledgeable” assistants⁹ with the ability to plan, reason, complete multi-step tasks, interact with the digital environment, collaborate with other agents, and make decisions without human oversight.¹⁰ Research suggests that such technology will not replace human expertise, but will likely demand a new set of skills to work in an AI-mediated environment.¹¹

In fact, employer surveys suggest that workers can expect nearly 40% of their existing skills to be transformed or rendered obsolete between 2025 and 2030.¹² Against this backdrop, “durable skills” (often known as “soft skills”) appear to be rising in value. The World Economic Forum finds that employers rank analytical thinking as the most critical core skill, alongside a broader mix of cognitive, interpersonal, and self-management capabilities, pointing towards growing demand for workers who navigate complexity, collaborate effectively, and adapt to changing task environments.¹³ Longer-term labor market trends reinforce this pattern, with occupations that combine technical and social skills seeing especially strong job growth and wage gains over the past several years.¹⁴

Overall, the implications for workforce training are significant: upskilling in specific technical competencies may no longer be sufficient to future-proof a career. The scale of AI-driven technological change may require many workers to reskill entirely—transitioning across industries and acquiring new competencies—over the course of their careers.¹⁵ Community colleges occupy a unique position to lead the response, given their

strong ties to both businesses and communities. However, doing so requires a clear understanding of both employer and student needs.

Community Colleges as “Dual-Customer” Institutions

Community colleges operate with a “dual customer” mandate.¹⁶ They are institutions dedicated to student success, providing credentials, skills, and pathways for individuals to access economic mobility. At the same time, at their best, community colleges also serve as talent development partners for local employers and regional economies.¹⁷ This dual orientation—serving both individual learners and employers—is a defining strength of the community college model, but also results in strategic complexity.

Community colleges serve a diverse and historically underserved student population. They are a primary college entry point for first-generation, low-income, Black, and Hispanic students, as well as a critical re-entry point for adult learners and workers seeking to retrain mid-career.¹⁸ In Fall 2023, 42% of students at public two-year colleges were Black or Hispanic, compared to 30% at public four-year institutions.¹⁹ Approximately 29% were aged 25 or older and 57% came from households below 200% of the federal poverty level.²⁰ Moreover, roughly two-thirds attend part-time and most work while enrolled.²¹ Those students—often considered “nontraditional” in mainstream dialogue—are now recognized by many leaders as the “new majority learners” at community colleges.²² They experience constraints including financial insecurity, structural barriers (e.g., immigration status, prior justice system involvement), and competing responsibilities such as work and caregiving.²³ For those learners, college is often a high-stakes career investment. When programs are misaligned with their work goals or labor market opportunities, the consequences—lost time, debt, and foregone earnings—can be difficult to recover from.

At the same time, community colleges are increasingly important talent development partners to employers. Since the 1970s, many have expanded their workforce mission beyond traditional degree and transfer programs to include contract training, upskilling incumbent workers, apprenticeships and participation in regional economic development initiatives.²⁴ At some of the most forward-thinking colleges, an entrepreneurial model characterized by strong industry partnerships and greater flexibility in responding to employer needs has emerged in response to ongoing changes in the labor market.²⁵

As demand for workforce programs at community colleges grows, policymakers are responding, both by scaling up support and increasing accountability for economic outcomes. Over half of community college credentials awarded in 2022-23 were workforce-focused.²⁶ As of spring 2025, enrollment in certificate programs increased by 4.8% year-over-year and is now 20% above 2020 levels.²⁷ At the federal level, the introduction of Workforce Pell Grants through the One Big Beautiful Bill Act (OBBBA) has expanded funding to certain short-term training programs in “high-skill, high-wage or in-demand industry sectors or occupations.”²⁸ Beginning in July 2026, the funding stream represents an estimated \$1.5 billion of federal investment over the next decade.²⁹ At the state level, performance-based funding models such as those authorized under Texas House Bill 8 (HB8) increasingly tie community college funding to “credentials of value” and workforce outcomes.³⁰ Those accountability frameworks, while creating administrative demands, also enable data-driven institutions to demonstrate and be rewarded for their effectiveness.

Delivering on the Mandate in a Fast-Moving Labor Market

A central challenge for community colleges is serving both learners and employers as technology and labor markets move faster. While there is

mounting pressure on training providers to meet workforce needs in real time, the gap between labor market signals and institutional response time is a consistent challenge in workforce education.³¹ Labor markets shift rapidly, whereas educational institutions operate within longer planning and approval cycles. New credit programs must navigate faculty governance, accreditation, and state oversight—structures that arguably protect quality. But, they may take multiple years to complete, in an environment where skill demands can shift within that same window.³² Moreover, that structural lag is compounded by a persistent funding gap. Despite serving a greater proportion of undergraduates, community colleges generally receive lower levels of government funding and fewer opportunities to apply for external funding than four-year institutions.^{33,34}

Against a backdrop of urgency and resource constraint, the proliferation of data and technology tools creates both new opportunities and complex decisions for community colleges.

Real-time labor market information—including data on job openings, wages, skills, and credential requirements—can help colleges identify emerging needs and align programs with student and employer outcomes.³⁵ While there is now a broader array of tools than ever before for tracking labor market demand and identifying emerging occupational opportunities, many are costly or difficult to interpret and act upon. There is also a growing proliferation of new technologies to address challenges to student success and employer collaboration—from career advising to work-based learning and talent matching. As institutions encounter a growing array of new platforms and tools—many of which increasingly leverage genAI and promise transformative results—they must become adept at using them to advance their missions.

Playbook Overview

This playbook is a guide for community colleges to leverage data and technology to improve workforce training. It builds on a two-year research and design collaboration between The Project

on Workforce at Harvard (HPoW) and Education Design Lab (EDL), focused on understanding and improving the use of data and technology to support program development and student workforce outcomes.

The first phase of the project produced case studies of four community colleges that are leveraging real-time labor market data and new technologies in innovative ways: Community College of Aurora (CCA) in Colorado, Riverland College in Minnesota, Hudson County Community College in New Jersey, and South Texas College. (See Appendix A for details on the case study selection process.) The research drew on nearly 150 interviews and focus groups with college leadership, faculty, staff, students, employers, policymakers, and experts, alongside observations and document review. The publication was released in [2025](#).

The second phase of the project consisted of “design sprints,” during which EDL supported CCA, Riverland, Hudson, and Victoria College in Texas in leveraging insights and recommendations from the case studies to build microcredential pathways³⁶ that lead to high-paying, high-demand jobs in their regions. In this third and final phase, our playbook translates those case and design sprint learnings, in addition to insights from two convenings of more than 100 community college leaders and additional literature reviews, into lessons for community colleges across the country.

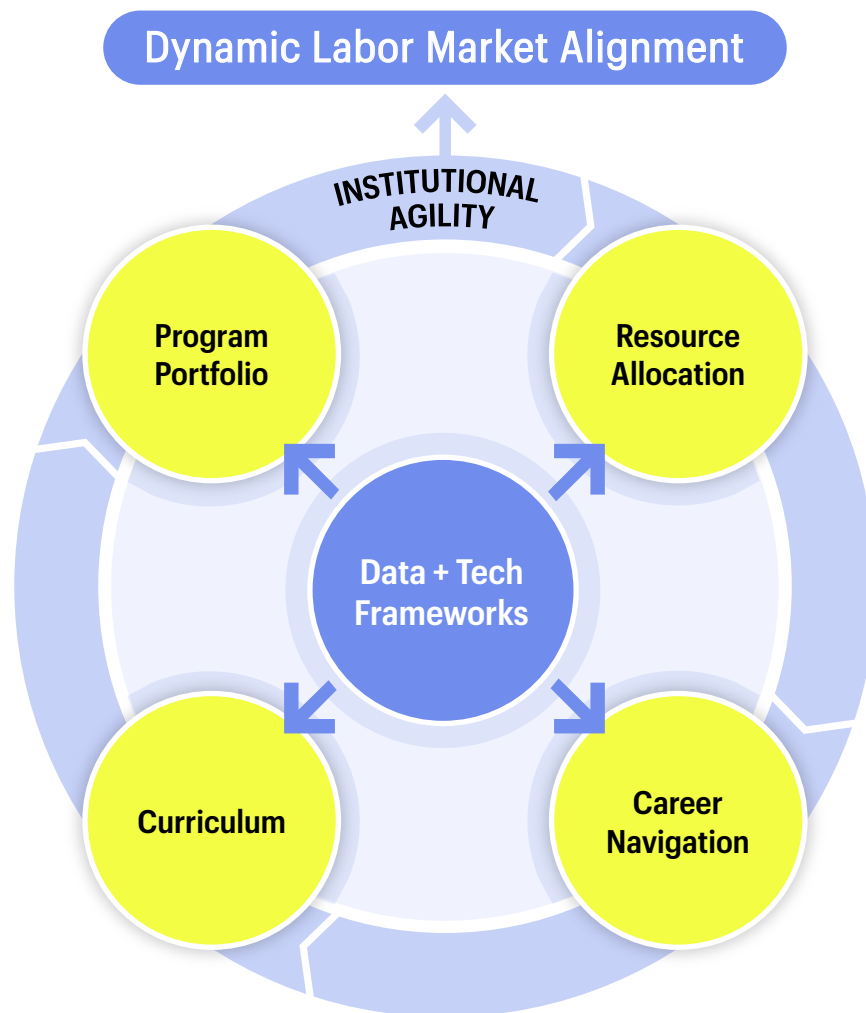
The playbook puts forward a model for workforce development at community colleges* (Figure 1) and is organized as follows. First, we identify two concepts that we believe will be central to community college workforce training in an era of technological change: **dynamic labor market alignment** and **institutional agility**. In the second section, we explore how community colleges can use both labor market and student data, as well as

*This playbook focuses specifically on workforce programs and workforce-oriented decision-making. It does not attempt to address the full educational mission of community colleges—including general education, developmental education, and transfer—and the broader academic enterprise.

emerging technologies, to become more agile and, ultimately, achieve alignment. **We examine which data inputs matter most and which technologies can deploy those data for better student outcomes.** Lastly, we dissect four key decisions that community college leaders make regularly and how they can use data and technology in

making those decisions to support dynamic labor market alignment. Finally, we address what ecosystem partners, particularly employers and policymakers, can do to help community colleges build and sustain this new model.

Figure 1: **New Model for Community Colleges in the GenAI Era**



Source: The Project on Workforce at Harvard.

Part 2: A Workforce Development Model for the GenAI Era

As generative AI transforms the nature of work and accelerates changes in skills requirements, colleges are reassessing existing workforce programs and developing new offerings to prepare learners for AI-enabled jobs and complementary skills. The speed and scale of these changes require colleges to play a more active role in responding to local workforce demands and meeting the goals and needs of both learners and employers.

Our case studies, design sprints, expert interviews, and review of the literature suggest that, in order to meet the moment, colleges need a broader and more dynamic understanding of labor market alignment. It goes beyond reacting to current job openings, taking into account evolving skill requirements. It must simultaneously account for issues of learner mobility and assume a proactive role in contributing to strategies to advance regional economic development. Second, colleges need the organizational capacity to be agile, responding to changing conditions quickly, repeatedly, and systematically.

In this section, we argue that dynamic labor market alignment should be a core goal: ensuring colleges continuously adapt to changing workforce demands while advancing opportunity for learners and communities. Achieving that goal requires institutional agility—the capacity to detect change, make decisions, and adapt programs, partnerships, and practices at the pace of a shifting labor market.

Dynamic Labor Market Alignment

Across research and policy, leaders have largely reached a consensus that labor market alignment—matching the supply of skilled workers to open jobs—should be a central priority for workforce development. For community colleges, that is generally understood as producing the right number of graduates who are prepared for vacant jobs.³⁷ Alignment is codified as a guiding principle in federal education and workforce development law, including through the Workforce Innovation and Opportunity Act (2014),³⁸ Strengthening Career and Technical Education for the 21st Century Act (Perkins V) (2018),³⁹ and the CHIPS and Science Act (2022).⁴⁰ Still, its application remains uneven.

In practice, the graduate supply and demand calculus can be complex.⁴¹ Academics have surfaced the “negotiation among stakeholders” that occurs in service of this goal, including among colleges, employers, and learners, each operating with different incentives, processes, and information.⁴² Employers, for example, expect applicants to possess specific job skills, which reduces their training costs and shortens the time they require to achieve full productivity. In effect, they largely shift responsibility onto colleges or other workforce training providers to prepare students for the workforce.⁴³ Colleges weigh additional factors such as enrollment, equity, and wage outcomes. Meanwhile, learners are seeking jobs that match their financial needs and aspirations, which may include the potential for career advancement and job security. Alignment requires balancing multiple objectives.

At the same time, all stakeholders face a major alignment obstacle: timing. Labor market alignment requires not only matching workers to jobs, but matching them at the right moment. Colleges

plan programs long before participating students enter the labor market. Employers need talent on much shorter timelines—sometimes in weeks.⁴⁴ As a result, employers, colleges, and students can readily fall out of sync, especially during periods of technological change when jobs and skills are shifting. Thus, while traditional definitions and processes of the labor market are founded on the assumption that alignment exists between skills providers and employers, in fact, current labor markets are constantly changing at unprecedented rates. It is not enough for community colleges to pursue alignment among programs and jobs once every few years; today's economy requires a near continuous realignment of programs in order to ensure tomorrow's workers have the skills required.

Against this backdrop, accurate data, including labor market information (LMI), is essential.

Colleges cannot adapt to shifts in employer demands, learner needs, or regional economic conditions without timely and actionable information about employment and workforce trends. LMI—including information about employment, wages, vacancies, skills, and workforce demographics—helps institutions identify education requirements across occupations, recognize emerging industries in the community, and evaluate whether programs are leading to quality outcomes. However, traditional LMI sources, such as the Bureau of Labor Statistics, the Census Bureau, and state sources, often provide limited information on emerging occupations and materially lag the labor market. More and more colleges are relying on real-time LMI, such as job posting analytics, that capture a more timely picture of job trends as they are posted online.⁴⁵ Private companies such as Lightcast and Revelio Labs sell real-time LMI products and solutions,⁴⁶ while many state agencies provide some level of real-time LMI, including through the National Labor Exchange. However, none of those sources are fully reliable.

While powerful in its utility, real-time LMI has limitations. While job postings data has been shown to correlate with job openings, not all job openings are posted online, and not all postings reflect real vacancies. Approximately 60-70 percent

of job openings are posted online, but middle-skill jobs that do not require a Bachelor's degree are underrepresented in the data,⁴⁷ creating challenges for community colleges that are seeking to align sub-BA workforce programs with those occupations.⁴⁸ Meanwhile, the information included in postings is inconsistent, volatile, and rarely contains accurate wage data.⁴⁹

Importantly in the emerging era of genAI, real-time LMI is not reliably forward-looking, making it difficult for colleges to anticipate future workforce needs and get ahead of timing challenges.^{50,51} While job postings can provide indication of changing employer demand, AI's ongoing effects on occupations, skills, and hiring practices will make planning difficult.^{52,53} The data also does not provide sufficient insight into systemic discrimination and entrenched inequities that distort supply and demand. Higher-paying middle-skill industries like manufacturing, construction and skilled trades, transportation and logistics, and engineering remain majority white and male.^{54,55} Meanwhile, female-dominated occupations, such as early childhood education, social work, and home health aides, consistently earn less than a living wage.⁵⁶ Both women and Black workers may be exposed to labor market disruption and displacement, given their exposure to types of work that are at risk of being automated away or substantially augmented by AI.^{57,58} Given the "new majority learners" community colleges serve, alignment becomes more than matching people to jobs, but understanding who is systematically being funneled to what kinds of jobs—and whether their career trajectories can be maintained in the future labor market.

Consequently, colleges cannot rely on LMI alone to plan; they must incorporate multiple sources—including direct employer input—and build the capacity to adapt quickly as new information emerges. At Hudson County Community College, one of the colleges featured in the case studies, leaders rely on employer partnerships to validate and supplement LMI trends and signals.⁵⁹ Meaningful industry partnerships can provide necessary context for colleges as they interpret data.

Table 1: **Comparing Traditional vs. Dynamic Labor Market Alignment**

Traditional	Dynamic
Periodic workforce planning	Continuous monitoring and adaptation
Focus on jobs and job-specific skills	Focus on jobs, career skills, mobility, equity, AI exposure
Relies primarily on LMI	Integrates multiple labor market sources and employer feedback loops
Reactive to employer demands	Helps shape regional workforce demands

Defining Dynamic Labor Market Alignment

Historically, conceptions of labor market alignment have assumed a static and reactive approach that assumes one-size-fits-all.⁶⁰ While useful, such approaches fall short in an era shaped by genAI and structural inequalities. Alignment can no longer be understood as a periodic matching exercise to vacancies, but instead, a continuous process of anticipating, responding to, and shaping labor market outcomes. That calls for a new definition of labor market alignment—one that is dynamic, forward-looking, and reflects the active role that community colleges can take in their regional economies, advancing economic opportunity for learners, employers, and the larger community.

We call this concept **dynamic labor market alignment**:

The goal of meeting evolving workforce and learner needs by promoting access to quality jobs, skills that sustain individuals across long-lasting careers, and inclusive regional growth.

Dynamic labor market alignment can be understood along three dimensions: quality jobs, career skills, and regional growth. The components translate the concept from an abstract goal into a practical framework for institutional decision-making. **Quality jobs** considers whether workforce programs lead to high-paying and resilient employment and equitable career mobility. **Career skills**

considers whether colleges are helping learners build the capabilities needed to succeed across multiple jobs in the changing economy. **Regional growth** considers how colleges contribute not only to filling existing jobs, but to shaping regional economic opportunity. The section that follows examines each dimension in turn.

Quality Jobs

Community colleges must not only understand which jobs are in demand, but also, which jobs provide meaningful economic opportunity for learners. That requires colleges to balance meeting employers’ immediate demand with their mission of promoting economic mobility and equitable opportunity for students. Not all jobs offer pathways to financial stability, advancement, or long-term career resilience. Consequently, the quality jobs dimension of dynamic labor market alignment requires collecting and analyzing data on multiple axes: earnings, equity, advancement, and AI exposure, as well as other phenomena, like globalization. None of those elements should be considered in isolation; rather, taken together, they should inform how colleges set priorities for program development and describe programs to potential enrollees.

Earnings

Earnings are one of the most straightforward proxies colleges can use to assess job (and program) quality, and there is substantial variation in earnings outcomes across workforce Associate’s degree programs. Some programs provide

pathways into positions that ordinarily pay far below a living wage.⁶¹ Certificates can be even less reliable pathways to economic mobility, with some evidence showing that short-term workforce certificates only rarely lead to jobs that pay a living wage.⁶² If a central goal for the college is supporting economic advancement and stability for students, colleges must look beyond job openings and consider whether those jobs provide family-sustaining wages.

A note on high-social value, low-wage jobs

For some students, earnings is not the only motivating factor in selecting their field of study.⁶³ Many students pursue careers that generate significant benefits for society, despite offering modest compensation. They include fields like early childhood education, human services, and behavioral health. Community colleges, therefore, must account for the value created by work beyond initial wages and anticipated lifetime earnings. Programs that meet student aspirations and provide high-social value—significant benefit to society and community flourishing—but pay workers below living wages should not be overlooked.^{64,65}

Colleges may feel pressured to sunset such programs entirely. However, some recent examples demonstrate colleges' ability to revise high-social value programs to ease the financial risk students might incur in pursuing them, such as lowering costs or unbundling programs. Community College of Aurora, for instance, broke their Associate's degree in behavioral health into a "certification and degree pathway" that allows students to learn in smaller chunks while earning workforce and industry certifications along the way.⁶⁶ This more flexible programming reduces the time and financial risk students may incur to pursue counseling.

Equity

Disaggregating labor market data by population (gender, race, income, etc.) can also help colleges identify and disrupt patterns of occupational segregation across industries and occupations.

Women (outside of healthcare), and Black and Hispanic students are underrepresented in workforce programs associated with higher earnings, such as computer and information technology, industrial and construction technology and trades, and engineering technology.⁶⁷ At the same time, these groups are overrepresented in workforce programs that lead to wages well below minimum wage, like early childhood education and human services. By considering disaggregated job earnings, colleges can spot where inequities persist and develop strategies to increase representation in higher-paying pathways for students that have been historically underrepresented. In this way, earnings serve not only as a measure of job quality, but of disparities in opportunity.

Mobility

For community college graduates, the first job is a critical step towards upward mobility. Especially for non-degree workers, the right entry-level positions can unlock significant opportunity in terms of long-term earnings, promotion, benefits, and job security, even when they offer similar starting wages.⁶⁸ Some occupations (e.g. emergency medical technicians, electricians, firefighters) serve as stepping stones to sustained career growth, while others provide limited prospects for advancement. Thus, community colleges should consider not only whether programs lead to employment, but whether they connect learners to jobs that support long-term career advancement.

AI Exposure

As AI shapes work across industries, community colleges should consider not only job quality today, but also how those jobs are likely to change over time. AI exposure provides one way to assess this future by estimating the extent to which the tasks performed within an occupation are likely to be affected by AI. There are multiple AI exposure metrics, and they differ in methodology and in the degree of disruption they assign to particular occupations, but they broadly agree on which

occupations are most exposed, such as computer programmers and copy editors.⁶⁹ That said, AI exposure is not synonymous with displacement, and AI continues to evolve. Early labor market evidence suggests the emergence of agentic AI coincides with the renewed growth of software engineering job postings—an occupation once scrutinized for its high AI exposure.⁷⁰ While some employers have cited AI as a rationale for layoffs and talent restructuring, significant evidence demonstrates AI is more often changing the nature of work rather than eliminating the need for human expertise.^{71, 72} Thus, colleges should consider not only which occupations are most susceptible to disruption, but also how AI is reshaping the skills required to succeed in them.

Career Skills

Traditional approaches to labor market alignment focus on the skills required for specific occupations and often assume those jobs have relatively stable skills requirements. In the age of rapid technological change, this approach is insufficient. Research suggests that genAI is more likely to transform the tasks workers perform rather than eliminate entire jobs.^{73,74,75} As tasks change within jobs, so do the skills required to perform them. Emerging scholarship on agentic AI suggests the shift extends even further. As AI systems become more capable of planning, reasoning, and executing increasingly complex workflows, the role of worker shifts from performing individual tasks to delegating, supervising, and validating AI-generated work.⁷⁶ In this context, agents do not replace human expertise, but shift where such expertise is applied—with a greater emphasis on problem framing, critical judgement, and integrating human and machine capabilities.

This shift further underscores why employers place an increasing premium on durable, transferable skills.⁷⁷ As AI assumes a larger share of routine cognitive work, workers will need to differentiate themselves through skills that are difficult to automate, such as communication, ethical

reasoning, judgement, and collaboration, as well as the ability to effectively direct AI systems. Such emerging trends in work require colleges to prepare learners not simply to use AI tools, but to effectively collaborate with AI systems.

If the half life of technical skills is decreasing, colleges must consider how individuals will adapt to labor market change,⁷⁸ including the skills that will enable them to thrive across those transitions. Researchers increasingly point to the importance of cultivating transferable or durable skills—including communication, active listening, and teamwork—as critical to enhancing workers’ ability to move across jobs and between industries.⁷⁹ Those skills are also associated with positive labor market outcomes and long-term career advancement.⁸⁰ While it is critical to align programs with technical skill requirements, dynamic labor market alignment also requires colleges to ask what skills will help learners remain resilient as technologies, industries, and jobs continue to change.

Identifying such skills is not straightforward. Many employers struggle to articulate their needs, especially small and mid-sized firms that lack a robust learning and development function.⁸¹ As a result, colleges cannot simply rely on employers to provide comprehensive and timely insight as to how to keep curriculum up to date. Instead, they must take a more active role in interpreting labor market signals, identifying emerging skills requirements, and translating those insights into programs and credentials. This challenge was reflected in a pulse survey of 44 community college leaders, which we conducted at a convening of workforce-focused, forward-thinking institutions in October 2025.⁸² Even among those leaders, only 18% agreed with the statement, “our programs emphasize transferable skills that will help students be resilient in the age of AI.” The challenge is not simply identifying and teaching new technical skills, but developing institutional capacity to identify, prioritize, and integrate durable skills with technical skills throughout workforce programs.

Regional Growth

The final dimension recognizes that some of the most effective, dynamic community colleges are not just suppliers of talent to existing local employers, but rather active participants in shaping regional economies. Community colleges occupy a unique position at the intersection of education, workforce development, and economic development.⁸³ Because they serve local learners, maintain close relationships with employers, and respond to regional work needs, they are often one of the few institutions capable of coordinating across stakeholders. This positions community colleges to do more than react to labor market demand. Instead, they can help attract new industries, support business expansion, expand equity across the labor market by reaching underserved populations, and strengthen workforce infrastructure; upon which regional economies depend.

That role can be particularly important in rural and economically distressed regions, where communities struggle with population decline, outmigration of educated workers, and loss of major industries. Research suggests that community colleges can help counter such trends by increasing local educational attainment and creating opportunities for residents to access quality training without leaving their community.^{84,85} Workforce training capacity also serves as an economic development asset that can be used strategically to attract employers. Data indicates that employers increasingly consider the availability of local talent and training infrastructure when making investment decisions.⁸⁶

Community college leaders appear to recognize the importance of this role. In our pulse survey, 79% of respondents reported that they often or regularly participate in regional economic development efforts. Many of these leaders sit on local economic development boards and already view themselves as partners in economic growth. Dynamic labor market alignment builds on this

existing role by encouraging community colleges to use their leverage to contribute to shaping plans for economic growth, support emerging industries, and strengthen long-term vitality of their region.

Community College Spotlights

There are several examples of community colleges attracting high-profile investments from employers moving to a new region. For instance, in anticipation of the passage of CHIPS and Science Act (2022), Intel announced plans to build a semiconductor manufacturing campus in Ohio, which necessitated workforce training infrastructure.⁸⁷ The company plans to commit \$50 million over a decade to Ohio's higher education institutions to support curriculum development, faculty training, laboratory equipment, and student pathways to semiconductor careers.⁸⁸ It built partnerships with Columbus State Community College and Lorain County Community College, developed a Semiconductor Education and Research Program, and created semiconductor technician certificates with local colleges.

Similarly, in the fall of 2022, Micron Technologies pledged to invest \$100 billion over the next 20 years to establish a semiconductor manufacturing facility in Central New York.⁸⁹ One of the key factors in making this strategic investment was the number and quality of higher education institutions that the firm could partner with, including SUNY Onondaga Community College (OCC). With Micron's support, OCC redesigned its mechatronic training program and curriculum.⁹⁰

When Amazon Web Services (AWS), the country's second largest employer, announced their second headquarters in Arlington County, Virginia in 2018, it built on an existing collaboration with Northern Virginia Community College (NOVA). AWS invested directly into NOVA's IT and cloud computing program, including in curriculum development, lab infrastructure, and faculty training. NOVA also partnered with Amazon to develop an apprenticeship program that trains veterans for cloud computing positions at the company, integrating classroom and on-the job training.

Other community colleges lead regional economic development strategies, connecting employers, workforce boards, and local governments to create new economic opportunities. For example, Monroe Community College leads the Finger Lakes region of New York as part of the state's One Network for Regional Advanced Manufacturing Partnership (ON-RAMP) initiative.⁹¹ The goal is to establish and develop training centers to support the state's growing advanced manufacturing industry. Monroe will lead collaboration among regional partners including workforce investment boards, employers, and other community colleges.⁹²

In Texas, San Jacinto College (San Jac) has established itself as a leading player in Greater Houston's economic development strategy.⁹³ The college is represented in major economic initiatives in the region across energy and petrochemicals, the space economy and aerospace, and pharmaceutical manufacturing. In 2025, San Jac launched the Center for Biotechnology, a training facility ahead of the emerging, multi-billion dollar investment in the manufacturing sector in the region.⁹⁴ The college's active engagement with regional economic initiatives, like the Greater Houston Partnership, supported its strategic positioning.^{95, 96} It was also supported by a dual credit program with a nearby school district that enables high school students to earn occupational certificates in bio-manufacturing, preparing them for careers immediately after graduation.⁹⁷

of preparing learners and regions for economic change. In the age of genAI, the challenge is helping learners access opportunities that are economically rewarding and resilient. Meanwhile, rather than acting solely as suppliers of talent, colleges can serve as strategic intermediaries that identify emerging opportunities, coordinate stakeholders, and shape regional growth trajectories.

Implications

This new definition of dynamic labor market alignment represents a core component of what community colleges should strive for as they adapt workforce offerings in an AI-driven labor market. In our convening survey of community college leaders, 95% somewhat or fully agreed with the statement, "dynamic labor market alignment is a valuable and achievable goal at my institution." For this mission to expand, colleges must shift workforce training from a narrow focus on filling existing vacancies to a broader mission

Institutional Agility

Dynamic labor market alignment requires community colleges to evolve offerings continually as the workforce changes. **Advances in genAI and a volatile labor market mean that colleges can no longer assume the workforce programs designed today will remain aligned for tomorrow.** At the same time, it is important to acknowledge that we are often incorrect when predicting future labor market change, especially during times of technological disruption. Thus, it is increasingly important for colleges to quickly and continuously detect, interpret, and respond to change as it occurs. We refer to this capacity as institutional agility.

Community colleges have adopted a wide range of workforce-focused innovations over the past two decades, including employer partnerships, noncredit programs, work-based learning opportunities, and accelerated credential pathways in an effort to improve labor market alignment.^{98, 99} Yet, such developments are often pursued as discrete initiatives, rather than as components of a broader institutional strategy arising from ongoing processes. As a result,

current research offers limited guidance on how colleges can consistently adapt to changing workforce conditions at a systemic level.

Institutional agility offers this insight. Rather than focusing on a specific workforce practice or program, institutional agility focuses on a college's broader capacity to detect change, interpret its implications, and respond in a timely and effective manner. While agility is largely embraced in the private sector, its applications in higher education remain nascent and theoretical.^{100, 101} In 2025, at the federal level, agility was named as a "core design principle of the education and workforce system."¹⁰² We build on this emerging work by applying the concept to community colleges in pursuit of dynamic labor market alignment.

We define **institutional agility** as:

Repeatable and systems-level capacity to detect, interpret, and respond quickly to labor market changes, while maintaining the quality and mission of the institution.

It is important to note that institutional agility is not synonymous with innovation. A community college

Table 2: **Opportunities and Obstacles for Institutional Agility**

Capability	Opportunities
Detect	LMI platforms that integrate multiple datasets can help identify shifts in employer demand and emerging occupations better than traditional data sources An industry hub that facilitates employer partnerships can gather early insights into emerging skills needs, technological changes, and workforce needs before they appear in labor market datasets
Interpret	Resourced institutional research offices enable colleges to connect LMI with student outcomes and performance data Cross-functional teams across workforce development, academic affairs, and institutional research help college translate signals to institutional strategies and action
Respond	Noncredit programs provide a flexible mechanism for piloting new programs and responding quickly to emerging workforce needs Regular program reviews can accelerate curriculum updates and development of new pathways

can launch a new program, pilot a technology, or redesign a course without fundamentally changing its ability to detect and respond to future changes.

This capacity is particularly important for community colleges, but it is difficult for institutions with limited data infrastructure. In both the case studies and the pulse survey, leaders expressed uncertainty about their college's ability to detect and interpret labor market signals. Only 19% agreed that their data systems are integrated and efficient and the same share agreed that staff possess the resources and expertise to apply data effectively. Furthermore, institutional structures are designed around stability, quality assurance, and shared governance, which serve critical purposes, but can also make it challenging to respond quickly to unfolding labor market changes. Program planning, curriculum design, and program approval cycles often operate on timelines measured in months or years, even as skill demands shift at a faster pace. **If dynamic labor market alignment is the goal, institutional agility is the capability that makes it possible.**

That said, community colleges cannot—and should not—simply move quickly for the sake of moving quickly. Decisions such as launching, redesigning, or sunsetting programs carry significant consequences for the institution, its faculty and students, employers, and the broader region. Thus, agility in higher education requires more than rapid action; it requires the ability to make those timely decisions while upholding quality, trust, and transparency.

The challenge for colleges, then, is not choosing between change or stability, but balancing them. The agile community college must establish a clear governance structure, decision-making process, and feedback mechanisms. In this sense, institutional agility promotes speed with guardrails; the capacity to adapt at the pace required by external change while preserving the mission, quality, and accountability that define community colleges. In Part 4, we explore promising practices that enable this.

Implications

Future workforce needs cannot be predicted with certainty. Therefore, the objective is not to focus on improving schools' ability to make predictions, but to cultivate their capacity to detect and adapt as conditions change. Institutional agility requires systems, structures, and capabilities that enable colleges to respond in a timely manner as the ground beneath them shifts. They already possess important assets that can and should be used to this end, including noncredit programs and employer partnerships. Yet, without reliable data infrastructure that enables them to gather, connect, and interpret labor market and student outcomes data, colleges are likely to find it difficult to distinguish meaningful workforce shifts from short-term fluctuations. Strengthening these capabilities will be critical if colleges are to achieve dynamic labor market alignment in a perpetually changing economy. The next section explores the data and technologies that can be leveraged in support of this goal.

Part 3: Data and Technology Frameworks

Dynamic labor market alignment defines what colleges are trying to achieve, while institutional agility describes the organizational capacity required to achieve it. In this section, we explore two critical inputs that enable success, based on our case studies and supplementary research: data and technology. **Data provides the signals that help community colleges understand evolving labor market conditions, learner outcomes, and regional economic trends. Technology enables those signals to be collected, integrated, analyzed, and acted upon at scale.**

This section provides two frameworks to help community colleges make sense of the proliferation of data and technology tools. The data framework focuses on inputs to generate necessary institutional intelligence; the technology framework focuses on platforms and tools that further enable institutions to process intelligence. Together, these frameworks provide a practical roadmap for detection, interpretation, and responsiveness required to drive sustained institutional agility.

Data Framework: Collecting Intelligence

Achieving dynamic labor market alignment requires quality data inputs—from both the labor market and education system. Community colleges must understand changing job demands, emerging skill requirements, employer hiring patterns, student enrollment trends, educational outcomes, and post-graduate employment trajectories. Yet much of that information remains fragmented across the ecosystem, dispersed among employers, workforce boards, state agencies, other educational institutions, and third-party providers. Thus, the challenge for college is not just accessing more data, but identifying what data is most relevant, integrating information from multiple sources, and translating it into actionable

insights. Without a clear framework for doing so, institutions risk relying on incomplete or lagging indicators that fail to capture current labor market conditions.

The framework includes two groups of data: labor market data—insight into occupational demands, industry growth, and emerging skills—and student outcomes data that illuminates student progression, credential attainment, employment outcomes, and earnings. In combination, those data sources create a more comprehensive picture of how effectively programs are meeting regional workforce needs and where opportunity for improvement lies. By consolidating the critical information required for decision-making, this framework helps colleges prioritize the signals that matter most and establish a common foundation for planning, program design, employer engagement, and continuous improvement.

Framework Development

The framework was developed through an analysis and consolidation of current postsecondary and workforce frameworks,^{103, 104, 105, 106, 107} alongside additional evidence on workforce outcomes. To compile the core indicators, we evaluated them along three dimensions. First, metrics were evaluated on the strength of evidence supporting their relationship to labor market alignment and student success. Second, metrics were assessed for consensus, examining the degree to which they are commonly used across policy, research, and institutional practice. Finally, metrics were evaluated for feasibility, considering whether community colleges can reasonably access, collect, and utilize the information given existing data systems and institutional capacity. Together, these criteria help balance rigor with practicality, ensuring the framework is both meaningful and actionable.

Table 3: **Data Framework Metrics**

Labor Market Data: Understand and adapt offerings to student, employer, and regional needs (consider earnings, mobility, equity, AI exposure)			
Element	Metric		Data Source
Job Demand	Current Employment	Estimated Employment	BLS OEWS, ACS
		25th percentile wage (annual or hourly)	BLS OEWS, ACS
		Median wage (annual or hourly)	BLS OEWS, ACS
		75th percentile wage (annual or hourly)	BLS OEWS, ACS
		Wage growth at 3 years	DOL CTOT
		Wage growth at 5 years	DOL CTOT
		Wage growth at 10 years	DOL CTOT
	Job Postings	Average # job postings per year	State labor market portals, private LMI providers
		Average # of credential-requiring job postings per year	State labor market portals, private LMI providers
	Skills	Skills requirements	O-NET; private LMI provider
Job Projection	Job Projection	10-year state projected jobs and % growth	BLS Projection Central
	Predicted AI exposure	% AI theoretical exposure	MIT Work Analytics Lab
	Current AI exposure	% AI current exposure	MIT Work Analytics Lab
Student Outcomes Data: Ensure programs and services lead to positive labor market outcomes			
Element	Metric		Data Source
Pathway Engagement	WBL participation rate	% Participating in WBL during program, by type (e.g. apprentice, intern, co-op)	Institutional data
		Median hours participating in WBL during program, by WBL type	Institutional data
	Career advising participation rate	% participating in advising during program, by advising type (e.g. 1-1, advising platform, workshop)	Institutional data
		Median hours participating in advising during program, by program type	Institutional data
	Program completion rate	% completed program within 150% of normal completion time	Institutional data
Employment	Employment	% employed in any job within 6 months of graduation (any form of employment)	State UI wage records
	Employment in field	% employed in field of study related to program within 6 months of graduation	State UI wage records
	Retention rate	% employed 2 years after graduation in same job as reported at 6 month mark	State UI wage records
Earnings	Median earnings	Median \$ earnings of employed graduates 6 months after graduation	State UI wage records
		Median \$ earnings of employed graduates 3 years after graduation	State UI wage records
	Living wage	% employed graduates earnings at or above the county-level	State UI wage records; MIT Cost of Living Calculator
Mobility	Earnings growth	Median % growth in earnings 5 years after graduation, relative to median earnings reported 6 months after graduation	State UI wage records
		Median % growth in earnings 10 years after graduation, relative to median earnings reported 6 months after graduation	State UI wage records
	Return on Investment (ROI)	% of graduates where median earnings in excess of 150% of the federal poverty line exceed the program's published tuition and fees after 3 years of graduation	State UI wage records; institutional data

How it Works

Labor market data focuses on understanding workforce demand in the short-term and long-term, while **student outcomes data** focuses on the extent to which the workforce programs lead to positive education and economic outcomes. Together, these data groups are organized across five key elements that provide a comprehensive view of the workforce and education ecosystem (see Table 3). They can be derived from multiple sources, including state and federal agencies, third-party providers, and internal administrative data. Examples of those sources are included in Table 4.

Table 4: **Data Source Categories**

Data source	Examples
Federal Available at the national level and gathered by the Federal Government. Level of disaggregation (e.g. to state/locality/ college level) may differ.	College Scorecard Post-Secondary Employment Outcomes (PSEO) surveys Workforce Innovation and Opportunity Act (WIOA) Performance Reporting American Community Survey (via U.S. Census Bureau) Bureau of Labor Statistics
State and local Depending on the state or locality, the range of sources and the quality of data provided by each will differ.	State Unemployment Insurance (UI) Systems State Labor Departments State or Local Workforce Development Boards
Third party Provided by non-governmental agencies, that may collect and generate new data, or aggregate data from other sources. This data may be at the federal, state, or local level, and may be free or paid.	Lightcast Chmura Postsecondary Data Partnership Student (via National Student Clearinghouse) MIT Living Wage Calculator US AI Labore Exposure Map
Internal Collected by colleges to measure labor market and student outcome data specific to their location and program offerings.	Surveys to past and current students Surveys to local employers Student Information Systems Other internal administrative data on participation and completion of programs, career advising, and work-based learnings

Data Framework

Labor Market Data

Element	Metric
Job Demand	Current Employment
	Job Postings
	Skills
Job Projection	Job Projection
	Predicted AI exposure
	Current AI exposure

Student Outcomes Data

Element	Metric
Pathway Engagement	WBL participation rate
	Career advising participation rate
	Program completion rate
Employment	Employment
	Employment in field
	Retention rate
Earnings	Median earnings
	Living wage
Mobility	Earnings growth
	Return on Investment (ROI)

Labor Market Data

The labor market data is designed to help colleges plan programs that meet student, employer, and regional needs in the short-term and long-term. To accomplish this, the element combines complementary metrics for the occupation aligned with the workforce program: **current employment**, **jobs postings**, and **job projections**.

Current Employment

Current employment data from sources like BLS, the Census, and O*NET provides an important complement to job posting data by measuring the size and economic value of an occupation within the relevant labor market context. Large employment bases often indicate sustained demand and a greater number of potential opportunities for graduates. Employment levels, therefore, should be considered along with wage levels and wage growth to understand whether occupations offer pathways to job security and economic advancement. Dissecting the skills for occupations offers important insight into the transferability of certain programming.

Current employment levels and job vacancies should be complemented by in-depth engagement with local employers and government bodies to understand how changes in business investment, firm formation, and policy may alter these demands in the long-term. This qualitative data should be combined with other information, such as data produced by regional workforce boards, to determine the direction and pace of change to inform the shape and speed of program changes.

Job Postings

Colleges should use job postings to capture current hiring activity using state or local data portals (e.g., National Labor Exchange) or private data from third-party providers (e.g., Lightcast). Job postings provide the most immediate signal of employer hiring activity and can help identify occupations and employers that are actively recruiting workers. Colleges can use posting data

to assess the volume of hiring activity associated with program-related occupations, the geographic markets in which jobs exist, the credentials and skills requested by employers, and the starting wages of jobs. Because job postings are updated continuously, they provide a valuable source of real-time data to support program planning.

Job Projections

While no community college can perfectly predict how the labor market will evolve, several data sources provide valuable directional insight into future occupational demand and the potential impact of generative AI on jobs and tasks. The US Department of Labor's Projection Central site provides state-level, 10-year forecasts (2024–2034) of employment growth and decline by occupation, including projected job openings and percentage change over the decade.¹⁰⁸ Where high-quality localized projection data exists, colleges should explore using that, as well. Complementing these projections, the MIT Work Analytics Lab's U.S. AI Labor Exposure Map estimates current and potential AI exposure across occupations¹⁰⁹ and their underlying tasks by integrating MIT task-level estimates with AI capability measures from Eloundou et al. (2023),¹¹⁰ Anthropic's AI Economic Index.¹¹¹ These resources can help colleges identify occupations that are expected to grow while also considering the extent to which those roles may be reshaped by AI, enabling more informed decisions about program development and curriculum design.

Each element in this labor market demand framework should be considered as one input among many, particularly given the uncertainty of the future labor market. As a whole, these measures can help colleges balance responsiveness to immediate employer needs with long-term strategic planning.

Data Framework

Labor Market Data

Element	Metric
Job Demand	Current Employment
	Job Postings
	Skills
Job Projection	Job Projection
	Predicted AI exposure
	Current AI exposure

Student Outcomes Data

Element	Metric
Pathway Engagement	WBL participation rate
	Career advising participation rate
	Program completion rate
Employment	Employment
	Employment in field
	Retention rate
Earnings	Median earnings
	Living wage
Mobility	Earnings growth
	Return on Investment (ROI)

Student Outcomes Data

In addition to satisfying employer demand and skill requirements through their programs, colleges are also responsible for ensuring the investment that students make in their programs results in quality learning and access to jobs that offer economic mobility and security in both the short- and long-term.

The challenge for colleges is that this cannot be solely measured by a single easily accessed statistics such as the employment rate, because what constitutes a positive outcome depends on several factors, including the program type (e.g., credit vs noncredit), field of study, and individual circumstances of the student. The Richmond Fed Success Rate attempts to measure the full spectrum of successes for community college students, including whether they receive a workforce credential, transfer to a four-year university, and persist in their education.¹¹² Similarly, our data framework considers multiple data points across different stakeholders involved in workforce training to get a full picture of how gains materialize, and whether the outcome is worth the opportunity cost.¹¹³

This framework breaks down outcomes data across four elements: **pathway engagement, employment, earnings, and mobility**. Measuring across those dimensions ensures community colleges are accountable to students investing in their programs and government bodies and employers who may be resourcing the institutions.¹¹⁴ Federal and state policymakers have been increasingly formalizing accountability through funding tied to minimum student outcomes standards, such as WIOA, and more recently, Workforce Pell grants.

Pathway Engagement

The pathway to strong workforce outcomes begins early. Research consistently shows that experiences such as meaningful work-based learning (e.g., internships and apprenticeships) and advising are associated with improved long-term workforce outcomes.¹¹⁵ Access to such exposure and support is particularly meaningful for underrepresented student populations, making it

a critical indicator of student success and equity. Work-based learning is also an indicator of the strength of employer engagement and a proxy for a learner's ability to apply practical skills, navigate workplace environments, and build relationships. While other measures during a learner's pathway experience may indicate workforce readiness—like licensure pass rate and skills tests—they vary widely across programs.^{116, 117} Nevertheless, they remain a complementary measure when reliable data is applicable.

Employment

Employment is a foundational outcome to measure, but it is important that it is tracked with sufficient detail to understand whether the nature of employment and the relativity of the earnings actually constitutes a positive outcome. For that reason, the framework goes beyond employment status six months after completion to also consider whether this employment is in the field of study and whether the employment was retained at the two-year mark—in other words, whether the program was relevant and whether benefits were sustained. While other frameworks consider additional data on the nature of employment, data that measures alignment to field of study was prioritized due to wider applicability, evidence of economic value,¹¹⁸ and its inclusion in forthcoming Workforce Pell requirements.¹¹⁹

Earnings

Similarly, earnings are measured at the six month and three-year mark, aligned with the current WIOA and Workforce Pell reporting requirements.^{120, 121} Earnings are evaluated against the widely-used and accessible MIT Cost of Living Calculator to provide a localized comparison that is easy to implement and more informative than alternative measures, such as comparisons to 150% of the federal poverty line or 150% of the average high school graduate earnings.

Mobility

The returns to education are typically realized over several years following completion of a program, and must also be weighed against the relative costs of completing the program and the

counterfactual income that the student would have otherwise been earning. For those reasons, mobility-specific metrics are also included in the framework to provide a more nuanced understanding of the long-run returns that short-term employment and earnings metrics may not capture. As those measures typically involve more than one data point to calculate, the mobility metrics included in this framework emphasizes the feasibility of measuring them for a college. For that reason, we selected earnings growth and a return on investment measure that are aligned to Workforce Pell reporting requirements.

When adopting these metrics, colleges should also consider existing mobility-focused data they may already be reporting—for example, through state performance-based funding programs. If these have already been measured and adequately consider the relative impact of program costs and how benefits are realized over time, then colleges should consider substituting these measures. Common mobility measures that may fall into this category include net cumulative earnings, which measures cumulative earnings less student cost to attend after ten years for colleges in Texas' performance-based funding system,¹²² and price-to-earnings premium, which measures time to recoup net costs on earning premiums compared to a high school graduate for colleges in California.¹²³ While those can be useful metrics, they present some feasibility challenges for colleges that are not already reporting them.

Equity

Equity is a critical component across all data dimensions, requiring institutions to disaggregate data across student groups to identify gaps in access, learning experiences, and outcomes. This element grounds the data framework in the college's student-centered mission; that is, a successful workforce program helps all students gain education and training to qualify for quality jobs. However, structural barriers and systemic racism are entrenched in workforce programs. Research indicates that community colleges that enroll a high number of minority students tend to

offer fewer programs with a high earnings premium and more seats in programs that have lower net earnings.¹²⁴ Likewise, the high rejection rates in selective high-value workforce programs disproportionately affects Black and Latinx community college students who are often underrepresented.¹²⁵

Equity gaps persist for learners during their program experience. Academic advising and support programs often prioritize transfer programs rather than workforce programs, where low-income students and minority students are overrepresented.¹²⁶ Moreover, equity gaps follow learners into the labor market. For example, lower socioeconomic status (SES) graduates earn nearly \$500 less per quarter than higher-SES peers with identical credentials from the same college with the same academic performance, and this gap persists for on average seven years in most programs.¹²⁷

For this reason, disaggregating outcomes data across student groups is critical across all four elements of student outcomes, including pathway engagement, where advising and work-based learning can play a critical role in correcting systemic disadvantages.

The relative importance of attributes across which to disaggregate data will vary depending on a college's institutional capacity, data availability, and geography. However, there are seven attributes with the greatest association to outcome variations that all colleges should seek to disaggregate, including: (1) race and/or ethnicity, (2) student or family income as measured through income quintile and/or Pell eligibility, (3) first-generation student status, (4) gender, (5), age group, (6) veteran status, and (7) attendance intensity as measured by full versus part-time status.¹²⁸

While other attributes can and should be tracked if institutional capacity and data allows (e.g. parental status, disability status, English as a Second Language status), colleges should initially aim to disaggregate at least those seven variables. In determining the degree of disaggregation within each of the attributes and the resulting number of

students falling into each group, colleges should aim to balance obtaining meaningful results from a large enough population size, while not masking differences across blended groups. For example, income quintiles or Pell eligibility status will provide more meaningful answers for some small to medium colleges, while more detailed income deciles may be able to provide additional insight for larger colleges.

Implementation and Policy Considerations

A concise set of labor market and student outcomes metrics can help colleges define the scope of evidence for decision-making, an important part of operationalizing institutional agility (see Appendix B for an example framework with illustrative data). The next obstacle, then, becomes collecting data across disparate ecosystems, particularly for noncredit programs, where data is inconsistent and scarce across institutions.¹²⁹ At the federal level, the data is not collected.¹³⁰ However, the recent expansion of Workforce Pell to eligible short-term programs will necessitate a new and robust data collection of noncredit programs.

Implementing this data framework is not a one-time exercise; colleges must continuously update and track data across sources and systems. In our pulse survey, when asked to rate how frequently their college uses LMI and student outcomes data to guide program design, more than half reported doing so at least once per academic year. However, less than one third of leaders indicated that their college has the capacity to link program-level data to longitudinal employment and earnings data. Longitudinal outcomes depend on data-sharing agreements, cross-agency collaboration, and mature state and education workforce systems—capacities that are uneven across states. For community colleges to be agile, they will need to connect disparate data to create a coherent picture of students and the labor market landscape. In short, institutional agility depends not only on access to data, but the capacity to transform that data into timely and effective

decision-making.

Technology Framework: Building Institutional Capacity

Why Technology Matters

The data framework outlines what information community colleges should measure. **Emerging technologies, including AI-enabled tools and platforms, can help institutions operationalize this framework, collecting and analyzing data, delivering instruction, supporting students, and adapting programs to changing workforce needs.**

In this way, technology underlies the capacity of institutions to become agile, allowing them to respond more quickly and effectively to labor market change.

The use of technology in higher education has grown significantly over the past decade, with tools and platforms proliferating widely, especially in the wake of the COVID-19 pandemic.^{131, 132}

Advances in genAI have further expanded the range of technologies available to colleges,¹³³ and employers increasingly expect workers to possess skills to not just use AI- but work alongside it.^{134, 135} Today, community colleges face a rapidly expanding marketplace of education technologies (edtech), each promising improvements in learning, advising, workforce preparation, or institutional effectiveness. However, faculty, staff, and students often differ in their levels of adoption, understanding, and trust of AI.¹³⁶ As a result, many colleges have adopted technologies incrementally or sporadically, rather than through a coordinated institutional strategy.

Technology decisions should be guided by institutional goals and processes, rather than vendor claims or technological trends. **The technology framework that follows is intended to help community colleges evaluate technology investments as they relate to dynamic labor market alignment and institutional agility.** It focuses on five capaci-

ties where technology can have great impact, based on our case studies: teaching and learning; student support; career navigation; work-based learning; and employer partnerships.

How it Works

The framework synthesizes learnings from the participating community colleges in this project, and a review of current literature and the field.

We organized technology by capacity type. For each, we describe the strategic opportunity, implementation tensions, and a promising model. Please note the tools featured in the promising models are not an endorsement or evaluation of their performance.

Implications

Taken together, the capacity types contribute to institutional agility by increasing a college's ability to detect change, coordinate action, and adapt programs in response to new information. Technology enables colleges to scale personalized support, strengthen connection between students and employers, improve access to LMI, and institutionalize knowledge that might otherwise remain fragmented across departments or individuals. In doing so, technology helps transform disparate forms of data into a comprehensive picture. It allows the analysis of longitudinal data, the ability to relate it to emerging, real-time data and create scenarios of future outcomes. That will enable college leaders to form a strategy and take action with greater confidence. Thus, the end goal is not technology adoption itself, but the creation of a more responsive institution capable of continuously aligning programs, student supports, and employer partnerships with the needs of a dynamic labor market.

Table 5: **Technology Framework**

Capacity Type	Strategic Opportunity	Implementation Tensions	Promising Model
Teaching and Learning 	Technology can help community colleges personalize instruction, expand access to learning support services, and develop the competencies increasingly demanded in the labor market. When implemented effectively, such tools can augment teaching and learning while helping institutions respond quicker to changing workforce demands.	Colleges must ensure that such systems enhance rather than diminish student autonomy, critical thinking, problem-solving, and meaningful human interaction.	Sinclair Community College launched the AI Excellence Institute, a three-year \$5-million initiative to integrate AI across teaching, learning, and workforce preparation. Having completed the first year and now entering the second, the institute conducted a comprehensive review of more than 325 academic programs to identify opportunities for AI integration, curriculum updates, and establish context-specific AI policies across departments.
Student Support 	Technology can help community colleges deliver more proactive, personalized, and scalable student support services. Tools such as early alert systems, predictive analytics, chatbots, and case management platforms, can identify student needs earlier, coordinate interventions across departments, and provide more timely support. By augmenting—not replacing human advisors and support staff—technology can help colleges deploy limited resources more effectively while tracking student progress, completion, and workforce outcomes. In doing so, technology strengthens institutional agility by enabling colleges to respond more quickly to changing student needs and continuously adapt support strategies to improve student success.	While AI can automate routine instructional and administrative tasks that allow advisors to focus on higher-value activities such as mentoring and relationship-building. However, colleges should ensure this automation does not come at the expense of human interaction associated with student persistence, belonging and success.^{137, 138}	At Riverland Community College, the Institutional Research Team developed an in-house data-modeling initiative—the Learning Lab Analysis—to track and improve student learning. This model includes predictive analytics to connect student outcomes to student success.

Table 5: **Technology Framework (cont'd.)**

Capacity Type	Strategic Opportunity	Implementation Tensions	Promising Model
Career Navigation 	At many community colleges, career services are underresourced.¹³⁹ AI-powered career tools can offer community college students more personalized and timely information and guidance to support better decision-making as labor market conditions continue to evolve.¹⁴⁰ In doing so, colleges can connect learners more effectively to workforce opportunities and continuously align career guidance with changing employer and regional economic needs.	Colleges must ensure these tools inform rather than prescribe student choice. The goal is to expand students' awareness of opportunities and strengthen decision-making while preserving exploration, agency, and alignment with individual interest and goals.¹⁴¹	Rather than relying on technology as a substitute for career advising, Hudson County Community College integrates tools such as Navigate 360, Career Coach, and Handshake into a "human-in-the-loop" approach where advisors help students interpret information, make decisions, and develop durable skills. This model demonstrates how technology can augment career coaching while preserving human relationships foundational to student success.
Work-Based Learning 	Work-based learning is a particularly effective strategy for improving workforce outcomes, helping students develop technical and durable skills, build professional networks, and connect classroom learning to real-world work environments.¹⁴² Yet, access to such opportunities remains uneven. Technology can expand access by streamlining the matching of students to opportunities, improving coordination between colleges and employers, and increasing visibility of labor market demands for students..	Learners need navigation through increasingly complex pathways.¹⁴³ Tools should go beyond listing opportunities, helping students discover, access, and progress through them.	Community College of Aurora (CCA) leveraged Riipen through a statewide partnership with the Colorado Community College System to connect students with employers across workforce programs, integrating course requirements and workplace realities. Riipen enables students to receive verified employer feedback and build portfolios demonstrating their skills, while providing faculty with data on student engagement, skill development, employer satisfaction, and program outcomes.

Table 5: **Technology Framework (cont'd.)**

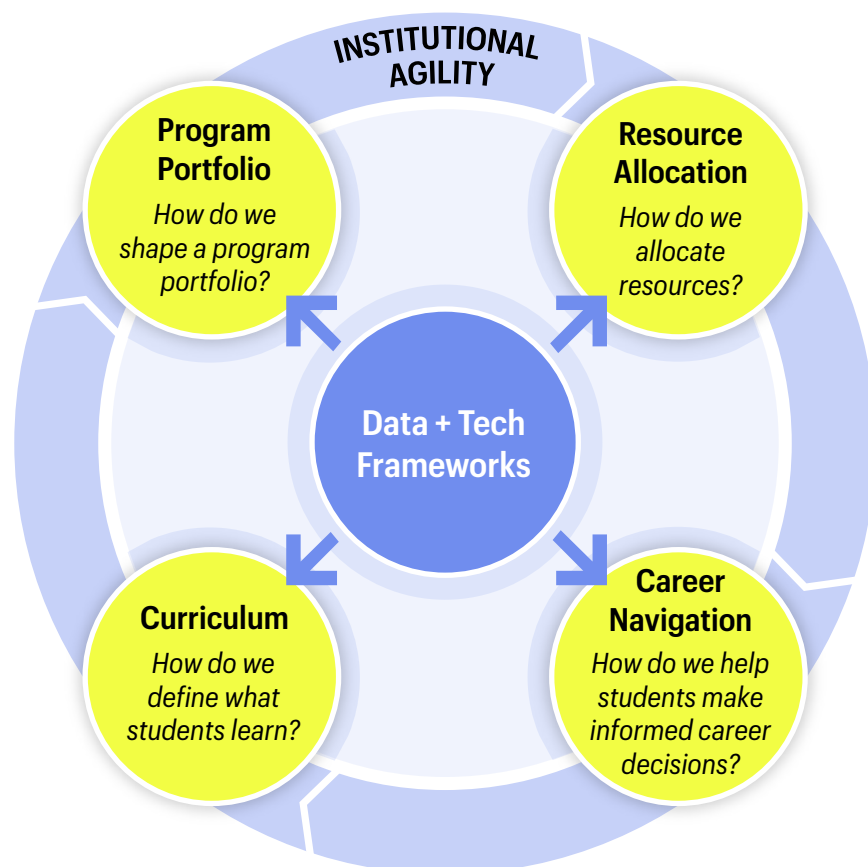
Capacity Type	Strategic Opportunity	Implementation Tensions	Promising Model
Employer Partnerships 	Employer engagement is often decentralized and relationship-driven, with interactions across multiple departments without consistent systems for coordination or knowledge sharing.¹⁴⁴ As a result, valuable employer input can remain siloed within individual programs or staff members. Technology offers the opportunity to institutionalize employer engagement by capturing interactions, tracking partnership activity, and coordinating outreach, and creating a shared record of partnership.^{145,146} Thus, technology can help colleges move from episodic engagement towards continuous partnership management.	Colleges should be careful not to replace relationship-building with transactional data collection. The challenge is using technology to strengthen and coordinate employer relationships while preserving the trust and responsiveness that makes those partnerships valuable.¹⁴⁷	Victoria College created integrated dashboards to document and track employer engagement across projects using Microsoft SharePoint. The dashboards list employers, engagement status, current projects, and staff. This site is available to all staff and faculty to encourage knowledge-sharing and cross-functional planning across departments.

Part 4: Using Data and Technology to Build Institutional Agility: Four Recurring Decisions

The promise of dynamic alignment and the power of institutional agility depend on whether community colleges can translate evidence into decisions. The previous sections introduced the core elements of the model: dynamic labor market alignment as the goal, institutional agility as the capacity to achieve it. The data and technology frameworks serve as tools to help colleges detect, interpret, and respond to change in a dynamic labor market. This section focuses on how those elements come together in practice.

Across the case studies, community colleges were most successful when they developed processes and structures that use labor market data and student analytics, technology-enabled services, and employer partnership strategies to drive dynamic labor market alignment by identifying emerging jobs, understanding the competencies employers are seeking, and targeting and supporting the students most in need. The colleges deployed agile learning processes and aligned resources with those insights to ensure students

Figure 2: **Four Decisions for Building Institutional Agility**



are thriving in the workforce and employers remain engaged.

To support community colleges in deploying this model, we outline four key questions for institutional decision-making that will help colleges navigate a rapidly changing workforce landscape (Figure 2). Specifically, we highlight promising practices for using data and technology to address these core questions at an institutional level. Importantly, these questions are recurring, interconnected institutional choices that must be revisited regularly as labor markets shift, student needs evolve, and organizational capacity grows. While they are not the only decisions college leaders make, our research suggests they are central to workforce alignment and institutional agility across geographies, demographics, and industries.

Importantly, data and technology capacity does not need to be perfect before it is useful. Colleges vary considerably in how they use LMI, with approaches ranging from centralized to decentralized, often depending on staffing, organizational structure, leadership priorities, resourcing, and policy requirements.¹⁵¹ The colleges featured in this project are acting with varying degrees of capacity and resources, but still prioritize data in their decision-making. Colleges that wait for an all-encompassing data source or technology tool will miss out on opportunities to strengthen their institution's agility in a fast-changing labor market.

The four decisions below form a feedback loop. Done collaboratively and with transparency, they also make colleges more accountable to their boards, legislators, employers, and communities they serve. For each decision, we explore the question, itself, and why it matters. We also identify potential challenges and promising practices.

Program Portfolio



Question

How do we shape a program portfolio?



Output

An evolving portfolio of programs aligned with student, employer, and regional demands

The program portfolio is a foundational decision that enables dynamic labor market alignment.

Most community colleges manage a workforce portfolio including a set of credit-bearing certificate and degree programs, along with a much larger set of non-credit programs. Program decision-making must balance the demands of multiple stakeholders, including students, employers, and the institution itself. Leadership must consider whether the portfolio is financially sustainable and mission-coherent. The strategy is, therefore, as much about deciding what not to resource as what to pursue. Colleges need a clear, defensible process for portfolio decisions that is not strictly reactive—shaped by one employer request, one grant opportunity, or one internal champion.

Challenges

Political Buy-in and Institutional Change Management

Program decisions may be especially contested because they can affect faculty roles, departmental identities, facilities, community relationships, and students' sense of opportunity. Even when labor market and student outcomes data suggest that a program generates poor economic outcomes and should be redesigned or sunset, the process can feel like a judgment on the value of a discipline or the people who teach it. Colleges that navigate the politics of

a portfolio review thoughtfully are able to treat faculty and staff as engaged and knowledgeable partners rather than downstream recipients of administrative decisions. A transparent and evidence-based process—with clear criteria, shared data definitions, and opportunities for faculty to engage with findings—can help offset fears of arbitrary decision-making by relating difficult decisions to the institution's mission.

Balancing Student Interest, Local Demand, and Absorption Capacity

Learners enroll in workforce programs for various reasons—many of which are not related to labor market demand. In a qualitative study of students in noncredit workforce programs, feasibility was a key consideration for enrollment,¹⁵² and our research has found that students often pursue programs based on their personal interest or values.^{153, 154} A core example is cosmetology, which may fill seats by promising flexible, creative careers, yet rarely are in demand and often lead to low earnings.¹⁵⁵ Meanwhile, portfolio decisions must distinguish between state and local labor market signals, ensuring neither over- nor under-supply according to local absorptive capacity. That is especially important in smaller or rural service areas, where a high-demand field statewide may not translate into enough local job opportunities for graduates. A study on 565 U.S. local labor

markets found that in half, at least 50% of middle-skill credentials would need to be awarded in different fields to match projected labor demand through 2031.¹⁵⁶

Promising Practices

Establish Regular Program Review Cycles

Colleges should create a regular program review cycle that goes beyond accreditation compliance and becomes a genuine instrument of portfolio management. The process should bring the right stakeholders to the table—including faculty, staff, employers, and, where appropriate, students and alumni—so that decisions reflect both quantitative evidence and deep “on the ground” familiarity with programs, learners, and regional demand. Such stakeholder engagement can also help surface implementation barriers, increase transparency, and build shared ownership over decisions.¹⁵⁷

A strong review cycle should ask a range of questions, such as: Is there sufficient occupational demand in the geographic market for this program? Does the program lead to quality jobs, in terms of wages and opportunity for economic advancement? What do current student education and employment outcomes look like? How do those outcomes compare across student groups? Can our college sustain the program quality? The metrics in the data framework are essential to answering these questions.

The review should produce programs that are aligned with student, employer, and regional demands. Criteria should be developed in advance, communicated clearly, and applied consistently across cycles. Colleges should also define decision rules before reviewing programs. For example, high student demand paired with weak completion may trigger program redesign and student navigation support; high wages paired with low enrollment from underrepresented student groups may trigger targeted recruitment and advising; low labor market demand, weak workforce outcomes, and high cost may trigger

Frameworks in Action: Data Framework

- Use labor market data to assess current employment, job postings in geographic market, credential requirements, wage levels, and the likely durability of demand associated with programs under consideration
- Use workforce outcomes data—including pathway engagement, completion, employment, earnings, mobility, and disaggregated equity outcomes—to assess whether existing programs are producing strong outcomes for students

program sunset. The Aspen Institute College Excellence Program’s Unlocking Opportunity initiative demonstrates how community colleges can redirect students from lower-value programs into higher quality pathways.¹⁵⁸



Spotlight

Community College of Aurora

Annual Program Review Process

The Community College of Aurora (CCA) instituted an annual program review process to ensure that graduates are prepared for in-demand, quality jobs with local employers. Led by the Vice President of Academic Success, that process reviews both credit and non-credit programs, incorporating LMI, industry partners, and faculty input. One stakeholder described it to be “looking less at individual programs and more as a portfolio of offerings,” orienting around mission and focusing on “right-sizing.”

CCA asked a key question: are existing credentials preparing students for careers with genuine labor market demand? CCA’s review cycle evaluated every credential against a consistent set of criteria: student demand, labor market alignment, economic viability of resulting careers, and program sustainability. LMI from Lightcast—including job postings, wage data, and employer hiring trends—was triangulated against industry advisory board input and the Colorado Talent Pipeline Report.

The college also calculates expenditure per enrolled student, per completer, and per graduate employed in the field. That surfaces difficult realities about programs with negligible enrollment and limited career outcomes.

Furthermore, faculty review the data and make the primary determinations about which programs to keep, modify, or close—a governance structure that distributes ownership and preserves institutional trust. CCA also maintains a key distinction: eliminating a program did not mean eliminating a discipline, as courses in sunset fields remained available for transfer pathways.

What followed recently was the deliberate sunset of more than 30 underperforming programs and the launching of 19 new programs in high-demand fields. Remarkably, CCA managed to do this without a single faculty layoff.

Source: Authors’ summary based on expert interview and case study.¹⁶⁴

Engage Employers to Validate Demand

Employers play a critical role by pressure-testing labor market data—validating whether jobs exist, whether demand is sustained, and whether the local labor market can absorb graduates. Annual advisory board meetings are rarely sufficient for this purpose.

Colleges need structured, recurring employer engagement that generates actionable intelligence about hiring volumes, credential requirements, and whether graduates are being retained. Colleges can use short, recurring employer surveys

or targeted industry roundtables to ask employers how many workers they expect to hire, which credentials they recognize, what wages they pay, and whether recent graduates are meeting expectations.¹⁵⁹ For example, to gauge opportunity for an electric vehicles program, Riverland College sent out a survey to local automotive employers to collect critical data points regarding their current employees’ experience, certification, and wages, as well as future hiring needs. This employer input is critical when job postings may misrepresent credential requirements, miss jobs filled through informal or non-online channels, and mischaracterize hiring signals.^{160, 161, 162}



Spotlight

Victoria College

Program Decision-making

Victoria College has formalized program decision-making through a structured flowchart that links employer input to institutional review and implementation. New program ideas typically originate from employers and are routed to the office of Institutional Effectiveness and Learning Technologies, which uses labor-market tools such as Lightcast and MAPS to validate demand, regulatory requirements, and accreditation considerations. If the occupation offers a family-sustaining wage, the dean calculates start-up and operating costs and student break-even enrollment. The executive vice president and president then determine feasibility. Non-viable proposals are closed with feedback to stakeholders; viable proposals move to planning, where the dean coordinates next steps and pursues external grants or foundation support alongside the college's new program approval process. Once funded, programs proceed to implementation and subsequent review of student and institutional return on investment.

This transparent, data-informed flow chart enables the community college to align offerings with regional workforce needs while managing risk and resources. By formalizing this process, Victoria College turns episodic employer requests into a repeatable governance process for workforce programs.

Victoria College has successfully leveraged grant funding to launch new high-demand workforce programs. For example, the Texas Reskilling and Upskilling through Education (TRUE) Grant provided critical startup funding for the development of the Class A and Class B CDL programs. As these programs transitioned from startup to ongoing operations, Victoria College shifted its focus to sustainable funding sources, including the Texas Public Education Grant (TPEG) and WIOA funding. Those resources help eligible students access short-term, high-demand workforce training programs that typically fall outside the scope of traditional federal financial aid, reducing financial barriers and supporting rapid entry into the workforce.

Source: Authors' summary based on expert interview and document analysis.¹⁶⁵

Build Dedicated Analytic Capacity

Shaping a program portfolio requires staff who can pull, clean, and interpret labor market and internal outcomes data on a regular cycle. Limited personnel capacity is a challenge experienced by many colleges. Among public two-year colleges, a survey finds that only 25% reported comprehensive data collection, analysis, and reporting capabilities for LMI.¹⁶³

Ideally, colleges need dedicated analytic capacity oriented toward program-level questions: which credentials are placing graduates in jobs, at

what wages, and for which student populations. Considering the range of metrics discussed in our data framework, colleges at an earlier stage can begin with Perkins data, advisory board feedback, completion data, and available placement information. More advanced colleges should consider the rate graduates attain a living wage, employment in the field, earnings growth, ROI, and long-term mobility. The goal is not to build an idealized shop, but to create a function that links replicable and repeatable evidence to ongoing decisions.



Spotlight

Northern Virginia Community College

Office of Strategic Insights

Dedicated to becoming more workforce-centric, Northern Virginia Community College (NOVA) saw a need to improve its LMI capabilities. Leaders acknowledged they were not engaging the right employers and were not speaking with students about work in consistent, data-informed ways. Rising to the challenge was a multi-year effort.

Beginning in 2016, NOVA began its journey of using LMI more strategically. In 2021, the college made a significant investment in building the institutional infrastructure to systematically translate labor market signals into program decisions. NOVA established its Office of Strategic Insights (OSI)—a dedicated

unit of eleven staff spanning institutional research, labor market intelligence, and planning and assessment—consolidating what had previously been fragmented functions into a single source of institutional data. OSI publishes an annual regional Workforce Index, maintains real-time labor market dashboards, and conducts employer surveys to track shifting hiring needs.

This initiative was further strengthened by the Business Engagement Center and a Guaranteed Interview program in 2022, connecting qualified graduates to local employers for interviews. This integrated model positioned NOVA to identify both program opportunities and sunset candidates with consistent, regionally grounded evidence.

Source: Authors' summary based on document analysis.^{166, 167}

Curriculum Design



Question

How do we define what students learn?



Output

A set of competencies, credentials, and learning experiences aligned with labor market demand and long-term career resilience.

A program can target the right field and still fail to meet student and employer needs. Portfolio review answers the question of what programs a college should offer. Curriculum design addresses a question one level deeper: what students should know and be able to perform when they leave. That requires colleges to translate occupations into competencies, sequence those competencies into credentials, and convincingly communicate to employers the value of the skills students acquired. Throughout this section, we use ‘skills’ to refer to specific expertise or abilities, and ‘competencies’ to refer to broader, work-relevant capabilities that combine knowledge, skills, and abilities associated with successful performance in a job family.¹⁶⁸

This decision is about preparing students for careers, not only their first jobs. Programs must prepare students for the jobs employers need to fill now, while also giving learners the range to adapt as the labor market continues to evolve. The goal is to make data-informed choices about which competencies are essential and which are transferable.

Challenges

Preparing Students for Career Mobility

While short-term workforce credentials, in particular, are designed to accelerate learners’ entry in the labor market, programs should not only prepare students for that initial job, but for a resilient career. When credentials are designed solely around entry-level jobs, students may face career stagnation without skills that are transferable or essential for advancement into adjacent occupations or preparing them to broaden their skill set through continuing education.

The degree to which a worker can transfer skills across occupations has been shown to improve their ability to adapt to disruption.¹⁶⁹ In designing curricula, colleges should consider skills that apply to adjacent occupations within job families, hold value across multiple employers, and can accelerate a workers’ career advancement. Data suggests that durable skills, specifically, carry a premium among employers. But, many employers report significant gaps in employees’ professional communication and workplace readiness.¹⁷⁰ Colleges, therefore, need to partner more closely with employers in determining how and where durable skills are taught and signaled to employers.

Frameworks in Action: Data Framework

- Use skills data from jobs and postings, credential requirements, and graduate outcomes to identify valuable credentials, skills, and adjacent jobs

Curriculum Governance and Speed

Curriculum change sits at the intersection of multiple stakeholders, approval processes, and quality controls. The array of actors—faculty, academic departments, curriculum committees, workforce divisions, accreditors, state agencies, licensing bodies, employers, and transfer partners—all share a stake in what is taught and how credentials are structured. They provide guardrails intended to protect quality, but can also pose a barrier to timely adaptation to workforce needs considering the changing nature of the labor market.¹⁷¹

Colleges, then, must identify and update the elements that can change within such bounds, such as assignments, case studies, activities, and simulations quickly, as well as leverage noncredit courses to test new programs. Other changes—such as new degree programs or accreditation—depend on external processes.

Scaling Work-Based Learning

Work-based learning (WBL) is a proven strategy to prepare and connect students to good jobs.¹⁷² Despite evidence on the impact of WBL on student learning and workforce outcomes,¹⁷³ community colleges face barriers to expanding high-quality work-based learning opportunities to all students. One survey found that two-year college students are much less likely than four-year students to complete internships, and that the participation gap is wider for Asian, Black, and multiracial students, as well as for women.¹⁷⁴

The logistics of scale are a central barrier. On the college side, WBL requires staff capacity to attract and secure employer partners, develop placements or projects, coordinate schedules, prepare students, monitor quality, collect feedback, and ensure that experiences are connected to program learning goals. These tasks become more complex when colleges are trying to serve dozens or hundreds of students across programs, employers, and locations. Moreover, increasing the supply of WBL may not necessarily lead to increased uptake if they do not fit the realities of students' lives. Approximately 70% of students work—with nearly 30% working full-time while enrolled—and more than 20% have dependent children.¹⁷⁵ Unpaid, inflexible, or poorly scheduled opportunities can, therefore, remain inaccessible even when students see their value.

Frameworks in Action: Data and Technology Framework

- Pathway engagement metrics can help assess existing WBL programs
- WBL learning technology platforms can help match students to projects, track participation, collect employer feedback, and document evidence of skill development

Promising Practices

Leverage LMI and Employers to Map Skills and Update Curricula

Curricula should be continuously updated as demand for new skills emerges. To ensure that updates are valuable, colleges should develop a repeatable process for translating occupational needs into teachable and assessable competencies. That process requires both leveraging LMI and qualitative employer inputs. LMI can help colleges identify which occupations are growing, which skills are appearing across job postings,



Spotlight

Community College of Aurora *Diesel Power Mechanics Associate of Applied Science*

As advanced machinery and heavy equipment industries faced mounting shortages of technicians, the Community College of Aurora (CCA) and Wagner Equipment Company—a major Caterpillar dealer operating across Colorado—recognized that traditional credential delivery was insufficient. The partnership they built offers a durable model for how curriculum co-design and employer investment can redefine what students learn.

Eligible Wagner employees may complete the program for free; students receive pay while training in Wagner shops, become eligible for full employee benefits after 90 days, and receive a tool kit upon program entry in exchange for a four-year work commitment. CCA's Diesel Power Mechanics Associate of Applied Science degree is condensed into a twelve-month program, with students rotating every two weeks between classroom instruction at CCA and hands-on training at Wagner—ensuring that curriculum reflects live industry practice rather than approximating it.

Promising a career with an average salary of over \$67,000, CCA recruits a competitive group of 40 to 50 students for the program each year. Moving forward, CCA is seeking to replicate this model in the behavioral healthcare sector.

Source: Authors' summary based on document analysis of multiple sources.^{176, 177}

which certifications are becoming more common, and whether changes reflect broader regional patterns.

Simultaneously, employer input plays a critical role. While portfolio review relies on employer engagement to validate demand, they can also contribute hugely by defining what constitutes job readiness. Employers can help clarify tasks, tools, standards, and hiring expectations, while faculty can determine how those expectations should be sequenced, taught, and assessed. EDL has operationalized this process through surveys for employers to identify the right combination of technical and durable skills for a job. Combining LMI and employer input helps mitigate the risks of designing curriculum from outdated occupational assumptions or overfitting curriculum to a single employer's immediate needs.

Build Work-Based Learning Infrastructure for Scale, Quality, and Access

WBL can help reduce the lag between changes in the workplace and changes in the classroom by placing students directly in settings where they practice the tasks, tools, and performance standards they will encounter on the job. Because such experiences adapt as businesses change, WBL creates a faster feedback loop between employer needs, student learning, and curriculum updates. Colleges should take full advantage of that feedback loop by designing WBL within pathways rather than relying on isolated opportunities. It requires building WBL components into course sequences and establishing employer co-design processes that ensure work-based experiences are aligned with program learning outcomes.

Colleges need dedicated infrastructure to scale WBL. As discussed, this includes staff capacity for the full WBL lifecycle—from employer engagement and placement development to feedback collection. It also requires moving from one-off relationships to repeatable partnership models, such as recurring employer projects, cohort-based

placements, or shared regional platforms that allow multiple employers and colleges to participate.¹⁷⁸ Such models can lower the barrier to entry for small and mid-sized employers and reduce the burden on colleges to negotiate each opportunity from scratch. Technology can support this work, as shown by Community College of Aurora's use of Riipen's platform to expand WBL opportunities.

Colleges should also define what counts as high-quality WBL and design for equitable access. Experiences should be paid, aligned with program learning outcomes, include meaningful work connected to the student's field of study, provide supervision and feedback, and generate evidence of skills students can use with future employers.¹⁷⁹ Unpaid or inflexible opportunities can exclude students who work, commute, or care for family members. To reach more learners, colleges can combine traditional internship models with

employer-sponsored course projects or simulated work experiences.

Design Credentials for Stackability, Portability, and Visibility

Drawing on EDL's framework, colleges can increase the value of workforce credentials by ensuring they are stackable, portable, and visible—allowing learners to build credentials over time and clearly signal their skills and competencies to the labor market.¹⁸⁰ Stackability enables credentials to serve as building blocks towards further certificates, industry credentials, or degrees rather than a stand-alone endpoint.¹⁸¹ They allow learners to enter the labor market quickly while preserving “on-ramps” towards future advancement.¹⁸² Rather than requiring



Spotlight

Sinclair Community College *Employer Partnerships in the Aerospace Industry*

Sinclair Community College demonstrates how WBL can be built through long-term industry partnerships rather than isolated employer placements. For nearly 100 years, Sinclair has leveraged academic expertise and experience in education and training the aviation workforce. To align with an ever-evolving industry, the college conducted extensive market research on firms in the emerging advanced air mobility sector, landing a strategic partnership with BETA technologies. Back with \$2 million in federal funding, this partnership was intentionally designed to be not just a transactional vendor agreement, but a collaborative relationship to support ongoing curriculum development, workforce training, and employer feedback.

A pioneer in this effort, Sinclair became the first academic institution to acquire BETA products: first, a flight simulator; second, an electric aircraft called the ALIA CTOL (Conventional Takeoff and Landing Aircraft). Together, Sinclair and BETA co-developed a series of hands-on training workshops that introduce current students and workers to electric aviation operations, aircraft systems, and emerging industry practices. The partnership also enables students to engage with cutting-edge technologies that are still shaping industry standards, providing exposure to real-world applications and direct interactions with industry experts. Beyond individual training experiences, Sinclair has leveraged the partnership to create a broader WBL ecosystem including employers, research organization, government agencies and other higher education institutions.

Source: Authors' summary based on expert interview and document analysis of multiple sources.^{183, 184, 185}



Spotlight

Middlesex Community College *MCC Decision Lab*

Middlesex Community College (MCC) has adopted a deliberate, institution-wide approach to integrating AI into teaching and learning to drive student success. Rather than pursuing isolated pilots, the college developed a three-year strategic plan that begins with assessing institutional needs, building AI literacy among faculty and staff, identifying internal and external partners, and systematically piloting AI-enabled tools with the potential to improve student outcomes. Led by the Assistant Dean for AI Integration, this intentional governance approach positions AI as a long-term institutional capability rather than a collection of disconnected technologies.

One tool that MCC is piloting and scaling across disciplines is an internally-developed Decision Lab, an AI-powered platform designed to help

students build professional judgment—an increasingly valued skill among employers. Through interactive simulations, students navigate realistic workplace scenarios and receive experiences tailored to their responses. The platform dynamically adjusts to factors such as students' risk tolerance, responses to setbacks, and weighing of priorities, creating personalized opportunities to strengthen their judgment and decision making.

The Decision Lab is designed for broad applicability across MCC's programs, building transferable skills in context. Simulations can be adapted to fields including finance, business management, culinary arts, education, and entrepreneurship, allowing students in diverse disciplines to develop professional competencies in practice-based environments.

Source: Authors' summary based on document analysis of multiple sources.^{186, 187}

students to choose between immediate employment and long-term educational attainment, stackable credentials hold the promise of enabling both. They also help employers create clearer talent pipelines and more consistent skill progression across occupations.

Under Workforce Pell, eligible short-term workforce programs must articulate into at least one credit-bearing pathway.¹⁸⁸ Programs that connect noncredit workforce training to certificates and degrees may be better positioned to expand access to financial aid while supporting learners' long-term career mobility. For community colleges, this may require strengthening articulation and data connections between noncredit and credit programs and aligning curriculum across credentials.¹⁸⁹

Portability ensures credentials are recognized and valued across multiple employers.¹⁹⁰ Here, colleges can leverage the data framework in two ways: first, through job posting data to see if there are multiple employers posting the same job with similar requirements; and second, through data on employment in the field of study to see if learners are getting jobs in related occupations across employers. Despite the high premium on durable skills in a labor market,¹⁹¹ there remains a systemic gap for early-career workers to showcase their skills in a way that is understandable, credible, and verifiable to employers. Consequently, organizations like EDL have sought to package durable skills as a microcredential to support learners in displaying in-demand skills.¹⁹²



Spotlight

Riverland Community College *Stackable Electric Vehicles Technician Certificate*

Southern Minnesota's manufacturing and transportation sectors are undergoing rapid transformation. Automation, electrification, and the proliferation of electric vehicles (EVs) are reshaping what skilled labor means and creating acute shortages of workers with the technical credentials to fill emerging roles. For Riverland Community College this shift represented both a workforce challenge and a curriculum design opportunity.

Riverland participated in EDL's micro-pathways initiative and engaged regional employers directly to map clusters of emerging skills with concentrated local demand. Electrification—spanning EV maintenance, smart grid systems, and advanced driver-assistance technologies—emerged as the highest-growth opportunity aligned to Riverland's existing strengths in

automotive and manufacturing programs. That evidence base informed the design of a stackable EV Technician Certificate, where employers, such as Freeborn Mower Electric Cooperative, could also provide curriculum input. A 2021 NSF Advanced Technology Education grant had already provided the foundation—upgraded labs, new diagnostic equipment, and faculty training in EV and hybrid systems—enabling the college to move quickly from insight to implementation.

The model has since attracted external validation and investment. In 2025, Riverland was awarded a \$60,000 EmployED grant through the American Association of Community Colleges, supported by General Motors, to formally launch its Electric Vehicle Certificate and align it with national industry standards. Riverland successfully translated clustered labor market signals into targeted, stackable credentials.

Source: Authors' summary based on document analysis of multiple sources.^{193, 194}

Career Navigation



Question

How do we help students make informed career decisions?



Output

A navigation system that improves informed choice, program completion, and job placement

Amidst a volatile labor market, community college students face an uphill battle in accessing resources that enable successful career navigation. Existing research demonstrates community college students often make program major decisions based on incomplete labor market information, and when presented with accurate information, they may adjust their educational and career decisions.^{195, 196} Our research has found that community college students often rely on their families for information;¹⁹⁷ while such personal connections can offer emotional support, they are susceptible to narrow factual bases for providing counsel and may limit exposure to high-paying career opportunities.

Colleges may know which programs lead to stronger outcomes, but students do not always encounter that information when selecting, entering, or persisting in a pathway. Thus, **community colleges have an institutional imperative to strengthen career navigation systems to inform and empower their students.**

Challenges

Lack of Student-Facing LMI

Much of the program information students need to make decisions—program costs, time to completion, earnings outcomes, transfer options, career pathways, and employment prospects—exists

somewhere in institutional or public systems. But it is often presented in formats designed for administrators, researchers, or compliance reporting rather than for students making enrollment and program decisions. Students may have to know which questions to ask before they can find the information that would help them choose well—an unrealistic expectation for many learners. In short, employers, job boards, and data providers alike should design sites accessible to potential applicants through the lens of their user experience (UX). They should not assume that individuals will have the energy or insight to labor through confusing or incomplete data and that relies on idiosyncratic terms.

The challenge is not simply whether data exists, but whether it is visible, timely, and usable.

A student deciding between programs needs information at the point of exploration, selection, registration, advising, and job search. Without such infrastructure, students may default to familiar fields, rely on informal advice, or choose programs without understanding likely costs, completion requirements, transfer implications, or labor market outcomes.

Frameworks in Action: Data and Technology Framework

- The Data Framework should be used to help students and advisors understand pathways. Labor market and student outcomes data can be used to make education and economic outcomes visible to students, advisors, faculty, and administrators.
- Technology platforms can present data in accessible, personalized formats for both students and career advisors.

Lack of Wraparound Support

Community college students are managing compounding financial and personal demands that impact their ability to succeed academically. A 2023 survey found that among stopped-out community college students, roughly half cited the need to work as a reason for leaving, while more than one-third said they could no longer afford their program.¹⁹⁸ Wraparound support, such as transportation, childcare, and other financial assistance, can help address such structural barriers, supporting the students who need it most. Models such as CUNY ASAP and One Million Degrees (OMD) have been evaluated using randomized control trials, demonstrating the short- and long-term impact of comprehensive student support. CUNY ASAP—which combines regular advising with financial support, free transportation and textbooks, and small caseloads—has nearly doubled three-year graduation rates for low-income students with remedial needs.¹⁹⁹ Similarly, seven years after enrollment, OMD increased annual earnings of more than \$14,000 for students who applied to programs while in high school.²⁰⁰ Yet, as emphasized in our data framework discussion, addressing student barriers requires the ability to detect them. Colleges need data systems that can disaggregate outcomes by relevant student characteristics to identify inequities.

Insufficient Advising Capacity

Advising caseloads at public two-year colleges can reach as high as 1,200 students per advisor at some institutions.²⁰¹ At such ratios, regular, personalized engagement is structurally impossible. Institutions where advisors have lower caseloads, greater use of advising technology, and more access to student data demonstrate smaller racial and ethnic equity gaps in graduation outcomes.²⁰² However, technology must come with the human capacity to act on what the technology surfaces. Early warning systems and predictive analytics can flag students who are disengaging, but only if caseloads are small enough for advisors to act on those flags.

Frameworks in Action: Data and Technology Framework

- Data should be disaggregated to identify gaps in access and success across student populations.
- Technology tools can provide early warnings for students at risk of stopping out, nudges for disengaged students, and support for career advising capacity.

Promising Practices

Deploy Data Across the Full Student Journey

Students need to encounter program outcome information at points across their full journey where critical decisions are made: onboarding, career exploration, program selection, registration, advising, financial aid conversations, transfer planning, and job search. Building student-facing data infrastructure is a necessary first step, but it is not enough.

Different data are useful at different stages. At the exploration stage, career interest assessments

connected to labor market data can help students move from broad interests to specific pathways and occupations. At the selection stage, program-level information on cost, time to completion, transfer, employment, earnings, and credential requirements can support informed choice. During persistence phases, pathway engagement data can help advisors identify whether students are off track, facing barriers, or enrolled in courses that do not advance their goals. After completion, employment and earnings data can help colleges evaluate whether pathways are producing the outcomes they promise.

Invest in Career Advising

Significant evidence across career navigation literature indicates that career coaching is an effective education intervention.^{203, 204, 205} Strengthening career guidance requires investing in enough coaches to maintain a manageable caseload, while also equipping them with the data and technology capacity to curate relevant and timely career guidance to students. Some institutions are experimenting with AI-powered technology to scale career advising where capacity remains thin. Data on the importance of human relationships²⁰⁶ suggests that colleges should find ways to integrate such tools with human coaches—not replace them—to maintain quality and trust.



Spotlight

Bunker Hill Community College

Career Literacy Framework

A persistent challenge in community college student success is the fragmentation of career development services, which are often concentrated in a single office, activated too late, and disconnected from academic programming. Bunker Hill Community College (BHCC) has pursued a deliberate alternative. The college created a distributed model of career literacy embedded across the entire student experience, from pre-entry through post-graduation.

The framework organizes career development across four categories of intervention—personal and cultural identity, discipline and program alignment, experiential learning, and structured reflection and synthesis—applied at each stage of the student life cycle. Early college students receive pathway advising and worksite exposure; enrolled students engage in learning communities, degree apprenticeships, clinicals, and internships; and post-graduation

alumni are drawn back into the institution as mentors, employer liaisons, and participants in a post-graduate advising network. Pathway coaches are assigned to students based on their area of study, and in the first semester help each student develop an integrated Financial-Academic-Career plan—treating economic and academic planning as inseparable from the outset.

What distinguishes BHCC's approach is the institutional logic, which requires deliberate culture change. This includes breaking down silos between academic affairs and student services, piloting initiatives with small dedicated teams, and then socializing findings upward through leadership. Career literacy, in this conception, is not a service delivered to students—it is a capacity built into how the institution operates across every stage of student engagement.

Source: Authors' summary based on multiple sources.^{207, 208}



Spotlight

Hudson County Community College *Student Success Programs*

Hudson County Community College boasts a number of award-winning student success programs. The Hudson Scholars is designed to engage incoming students in personalized academic counseling and support to help them succeed in college. The program specifically targets students enrolled in nine or more credits who may face academic or socioeconomic challenges that could hinder their success. Scholars receive one-on-one advising, participate in campus activities, and can earn up to \$500 per semester by meeting academic goals and regularly connecting with academic counselors.

Tools such as EAB's Navigate 360, Lightcast's Career Coach, and Handshake aim to assist rather than take on authority in advising. Through workshops and one-on-one advising sessions, Hudson's instructors and staff demonstrate advising tools to model best practices to students. Through this "human-in-the loop" instructional framework, students develop durable skills, such as critical thinking, ethical reasoning, communication, and adaptability that supports their career navigation.

Source: Authors' summary based on multiple sources.²⁰⁹

Resource Allocation



Question

How do we allocate resources?



Output

A budget and staffing plan that aligns funds, people, technology, facilities, and institutional attention with evidence-based priorities

What a college dedicates its resources to is indicative of what it values. Resource allocation includes funding as well as staff time, physical space, equipment, technology, leadership attention, and political capital. A college may identify high-demand programs or initiatives to redesign curriculum, but without aligned resources, those efforts remain aspirational.

This question must be answered together with the program portfolio, curriculum, and career navigation questions above, turning priorities into practical choices. If program reviews show strong labor market demand and strong student outcomes, the college may need to invest in faculty, equipment, facilities, and marketing to scale the program. If evidence shows weak demand or weak outcomes, the college should consider redirecting resources. That same logic applies at the functional level. Some research suggests colleges with successful workforce development programs are the ones that adequately staff and fund the workforce function, treating it as a central institutional priority.²¹⁰

The resource decision requires a willingness to make difficult choices about where to invest and where to retrench. That must be done with an equity lens that ensures such choices do not systematically disadvantage already-underserved populations.

Challenges

Persistent Resource Limitations

Community colleges operate under significant funding constraints. Public two-year colleges receive substantially less education revenue per full-time equivalent student than public four-year institutions, even though they serve many students with greater financial, academic, and social support needs.^{211, 212} Many colleges are also managing enrollment volatility, rising fixed costs, aging facilities, and uncertainty in federal and state policy.

Under such conditions, the predominant practice of incremental budgeting is understandable. Traditional community college budgeting often begins with the prior year's budget and adjusts around the margins.²¹³ Such incremental budgeting can preserve misalignment. Programs that no longer produce strong outcomes may continue to receive resources, while emerging priorities remain underfunded. Moving toward evidence-based budgeting requires leadership commitment and clarity about what the institution is trying to optimize.

Pilot Programs: Scaling vs. Stopping

Pilots are essential for institutional agility, but they create resource challenges when not designed

under a larger decision framework. A college may launch a pilot to test a new program, technology tool, advising model, or employer partnership, but scaling requires more than promising early results. It requires evidence of effectiveness, a clear understanding of full costs, staff capacity, systems readiness, and a plan for sustaining the work beyond the initial grant or champion. Many pilots persist—before they have demonstrated sufficient evidence of impact—or continue long past the point where evidence would suggest reallocation.²¹⁴

Equity in Resource Concentration

Colleges need to balance resource efficiency with equity. Directing additional resources towards programs with the strongest labor market returns may maximize overall workforce outcomes, but can also reinforce existing disparities. Because enrollment patterns closely mirror broader structural patterns of occupational segregation,²¹⁵ investment in quality workforce programs should be paired with strategies that expand access and support for underrepresented student populations. Otherwise, resource allocation may increase overall performance but leave equity gaps unchanged—or even deepened.

Promising Practices

Integrate Program Review and Budgeting

The budget process should operate on the same calendar as program reviews, using the same metrics and aligned conclusions. Colleges should connect reviews, resource allocation, and strategic planning so that evidence about demand, outcomes, costs, and equity informs budget decisions. A program identified for expansion should have a resource plan and a program identified for sunset should have a teach-out plan and, where possible, a strategy for redeploying faculty, facilities, and funds.

Within that integrated process, colleges should consider full-cost budgeting. Workforce programs

often require more than instructional salaries: equipment, maintenance, software, faculty development, employer engagement, student supports, data collection, accreditation, administration, and future replacement costs all affect quality and sustainability. Yet colleges may not fully account for such costs because some expenses are hidden in central budgets, absorbed through uncompensated staff time, covered temporarily by grants, or treated as one-time start-up costs rather than recurring obligations. Embracing a full-cost framework emphasizes direct and indirect costs, unfunded work, fixed asset needs, and change capital required to launch or adapt programs.²¹⁶

Overall, budgets should be tied to institutional goals, informed by evidence, prioritized toward cost-effective strategies, monitored for performance, and adjusted over time.²¹⁷

Frameworks in Action: Data and Technology Frameworks

- Connect program costs to outcomes, including completion, employment, earnings, living wage attainment, ROI, mobility, and disaggregated equity outcomes
- Use pathway engagement data to identify where investments in advising, work-based learning, emergency aid, or wraparound supports may improve completion and labor market outcomes.
- Technology investments should be tied to a defined use case—teaching and learning, student support, career navigation, work-based learning, or employer partnerships—and evaluated against evidence of adoption, effectiveness, accessibility, equity, privacy, and sustainability

Develop Clear Criteria for Evaluating Pilots

Before launching a pilot, colleges should define what success looks like, what data will be collected, how long the pilot will run, who owns the decision rights as to whether or how to proceed, and what thresholds will trigger scale, redesign, or discontinuation. That applies to program pilots, advising models, employer partnerships, and technology tools. For example, a workforce program pilot might be evaluated on enrollment, completion, employer participation, work-based learning placements, employment in the field, earnings, student satisfaction, and equity gaps. A technology pilot should be evaluated not only on adoption, but also on accessibility, privacy, security, interoperability, staff capacity, cost per student served, and evidence that the tool improves the specific outcome it was purchased to address.

Such practice directly supports institutional agility. Agile institutions do not simply try more things; they learn faster from what they try. Clear pilot criteria allow colleges to scale what works, stop what does not, and avoid the accumulation of small initiatives that consume capacity without changing outcomes.

Co-funding and Collaboration with External Partners

Partnerships with other community colleges, four-year institutions, employers, and nonprofit intermediaries can unlock shared resources—financial and otherwise—that no single institution could sustain alone. **Shared arrangements can help colleges pool the cost of labor market intelligence platforms, institutional research tools, data infrastructure, equipment, facilities, or specialized staff capacity.** For example, community college systems, districts, and associations can purchase private real-time labor market information tools through regional consortia to improve efficiency and encourage collaboration.²¹⁸ Such arrangements are especially valuable for

smaller colleges that need access to sophisticated data or specialized training capacity but cannot justify the full cost alone.

Employers warrant particular attention because they benefit directly from community college talent pipelines. Co-investment can take many forms beyond direct financial contributions, including: equipment donations, paid internships, apprenticeships, tuition support, faculty externships, and shared training facilities. Employer co-investment is not only a funding source; it is also a demand signal for college programs. New Workforce Pell rules further underscore the importance of structured partnerships: eligible workforce programs may use written arrangements with outside entities, including employers, to provide up to 25% of a program, with a higher threshold for Registered Apprenticeship Program sponsors providing related instruction.²¹⁹



Spotlight

Hudson County Community College

Gateway to Innovation

When the COVID-19 pandemic eliminated jobs across Hudson County's hospitality, retail, and service sectors, Hudson County Community College (HCCC) identified both a crisis and an opportunity. Displaced workers needed rapid pathways into higher-wage industries, and regional financial services and technology employers—including some of the largest firms in the world, located across the river in Manhattan — needed talent. The Gateway to Innovation program was HCCC's structured response to that alignment.

Launched in 2021 with an initial \$850,000 investment from JPMorgan Chase, the program was designed to provide short-term, upskilling credential attainment opportunities in financial services, information technology, healthcare, and logistics HCCC for non-traditional students, including career changers and adult learners. The model integrated asynchronous online learning with synchronous and in-person components, eliminating enrollment waiting

periods and deploying a dedicated Student Success Coach to provide wraparound academic and non-academic support. An active employer advisory board shaped program content and facilitated work-based learning and employment opportunities.

The program has enrolled over 450 students with a 90 percent completion rate—and has continued to attract employer investment. The initiative was subsequently bolstered by a \$1.75 million U.S. Department of Labor grant and the Bank of America Charitable Foundation recently awarded HCCC \$150,000 to expand the program's work-based learning offerings. For institutions considering how to allocate non-credit resources, Gateway to Innovation demonstrates that employer-funded, sector-targeted programming can simultaneously serve displaced workers, satisfy regional employer demand, and generate the sustained philanthropic investment that makes expansion possible.

Source: Authors' summary based on multiple sources.^{220, 221, 222}

How Institutional Learning Facilitates Agile Decision-Making

The four questions address recurring choices about what programs to offer, what students should learn, where resources should go, and how students move through pathways. **Institutional learning facilitates decision making amidst changes in the labor market, enabling institutions to remain agile.** A program portfolio that was well-calibrated two years ago may have drifted away from current labor market needs. A curriculum that reflected employer priorities at launch may now be misaligned. Resource allocations made under one set of assumptions may no longer hold.

The agility demanded from community colleges requires an institutional shift towards continuous learning and improvement. Policies and external agencies can create accountability metrics, but data compliance alone does not produce learning. Reports submitted to external agencies should not be the endpoint of analysis, but rather inputs for the four questions above. Institutional learning is the capacity to ask: What did we decide? What evidence did we use? What happened? Who benefited? What assumptions did we make and were they ultimately justified? What should we change? Refining that capacity requires integrated data infrastructure and data literacy, feedback loops embedded in programs and systems, and governance structures that make learning part of normal institutional work.

Build Integrated Data Infrastructure and Data Literacy

Institutional learning depends first on whether colleges have the data capacity to detect what is happening and interpret the evidence. Yet improving data infrastructure remains a challenge for many colleges. At many colleges, departments collect and manage data, but they do not communicate, making it difficult to construct a comprehensive

evidence base that meaningful program evaluation requires.²²³

Using our data framework, colleges can build a data environment where key metrics are visible across the institution, encouraging transparency rather than siloization. Colleges at an early stage can begin with an internal data audit organized around the data framework—examining which metrics are already produced automatically, which require manual inputs, which are missing entirely, and which cannot be disaggregated by student groups. That is especially relevant for noncredit programs. Because noncredit education has often existed outside federal reporting requirements and traditional student information systems, many colleges and states lack the data infrastructure needed to track enrollment, completion, credentials, and employment outcomes consistently.²²⁴ Workforce Pell will increase pressure to improve such systems because eligibility and accountability will depend on better program-level data for short-term workforce programs. Colleges should move towards bringing noncredit data into institutional reporting systems, creating common student identifiers across credit and noncredit where possible, and building the same key metrics around pathway engagement and outcomes.

Moreover, data literacy must be built alongside infrastructure. Colleges can support better use of data through role-specific training, dashboard tools for different users, and communities of practice that help faculty and staff move from receiving data to using it. Among our convening survey participants, only 36% reported that their college offers training or communities of practice to build data skills often or regularly. Research on data-informed campus cultures identifies data ambassadors and champions—individuals across the institution who can model and encourage evidence-based practice among colleagues—as a more effective change mechanism than top-down mandates.²²⁵



Spotlight

Dallas Community College

Labor Market Intelligence Center

Dallas College established the Labor Market Intelligence Center (LMIC) in 2015 as a permanent, college-wide institutional function embedded in strategic decision making across academics, student success, workforce development, and operations.

The LMIC conducts research on the local labor market, program alignment, and socioeconomic barriers affecting Dallas College students and the broader community, making its tools and analysis available to internal and external partners alike.²²⁶ The center operates with a staff of eight and draws on an unusually rich data infrastructure—including longitudinal student records, Bureau of Labor Statistics data, private LMI providers, Census data, property appraisal data, and analytical tools spanning SPSS, R, Python, PowerBI, and GIS.²²⁷ When faculty or department chairs propose a new program, they consult the LMIC for supporting labor market evidence; the center analyzes occupational demand, wages, and employer landscape before any program development proceeds.

What distinguishes Dallas College's model is its institutionalization. The LMIC is structured to synthesize labor market and regional intelligence—including employment trends, occupational demand, wages, skills and competencies, and equity considerations—to inform planning and alignment across the institution at the sector level. Dallas College has built the capacity to produce, interpret, and act on that intelligence internally, making continuous labor market learning a feature of how the institution governs itself.

Source: Authors' summary based on multiple sources.²²⁸

Formalize Feedback Loops

Institutional learning also requires formal feedback loops that are built into the rhythm of decision making rather than added as special projects. Our pulse survey suggests that many colleges have begun using data for improvement, but have not yet made feedback loops standard or widespread practice on a frequent basis. Results show 44% of leaders reported that their college uses student outcomes data to revise courses and programs often or regularly, but only 34% report that data-driven program evaluations concretely inform resource and program priorities.

For each question, colleges should define in advance what evidence will be reviewed, how often it will be reviewed, who will interpret it, and what changes it will inform. By establishing decision calendars, assigning owners for each evidence cycle, setting thresholds for when data trigger action, and documenting what decisions were made in response, colleges can develop deep competence and make institutional learning cumulative.

Strengthen Governance and Culture

Finally, institutional learning is a governance and culture challenge. Community colleges are already operating under severe constraints, and additional review and adaptation cycles can feel burdensome. Research on community college organizational change identifies a lack of professional development in change management, weak middle management capacity, and governance structures that slow or stall reform as structural barriers persist across institution types.²²⁹

To make learning sustainable, colleges need governance structures that assign clear ownership, protect capacity, and facilitate a data-driven culture. That means clarifying which roles and bodies are responsible for review and adaptation and who has authority to recommend or approve changes, as well as building time and marshaling

resources for data review, program evaluation, and cross-functional planning into normal calendars. Continuous improvement depends on more than temporary grants, volunteer labor, or a few committed champions. It needs to become a discipline.

Implications

The four questions in this section provide a practical guide for translating labor market evidence into institutional action. They shift workforce alignment from a series of isolated initiatives toward a repeatable process of organizational learning.

Colleges that regularly revisit their program portfolios, curricula, student supports, and resource allocation using evidence and employer feedback are better positioned to respond to technological change, demographic shifts, and evolving employer demand while continuing to serve increasingly diverse student populations.

At the same time, institutional agility has limits. Community colleges operate within policy, funding, regulatory, and labor market environments that they do not control. Their ability to use data effectively, invest in technology, expand work-based learning, or redesign programs depends in large part on the incentives and partnerships surrounding them. Building a workforce system capable of adapting to rapid economic change therefore requires action beyond the college itself. Employers must become more active partners in defining competencies, providing work-based learning opportunities, and signaling demand, while policymakers must create funding, accountability, and data systems that reward continuous adaptation rather than episodic compliance. The recommendations that follow focus on these complementary responsibilities.

Part 5: Employer and Policymaker Recommendations

Community colleges are doing extraordinary work in response to the changing technology landscape. The four decisions laid out in Part 4—program portfolio, curriculum design, career navigation, resource allocation—and institutionalizing learning require difficult judgments under uncertainty, often with limited resources and imperfect information. We have argued that those decisions should be driven toward a goal of dynamic labor market alignment, with institutional agility a capability that makes alignment possible, and data and technology as enabling infrastructure.

Currently, students bear the majority of the economic risk when labor market alignment fails—in lost time, debt without earnings returns, and foreclosed opportunity. Community colleges cannot close that gap alone; policymakers and employers also have a critical role to play. The colleges profiled throughout this playbook are early movers—institutions that have taken risks and invested limited resources in the processes, structures, and capital required for dynamic alignment and institutional agility. Sustaining and scaling that work requires the broader workforce ecosystem—particularly employers and policymakers—to contribute as partners.

Policymakers

Policymakers can support community colleges in capacity-building for agility, with a focus on creating economies of scale in data and analysis and expanding the flexibility and funding colleges need to test, adapt, and scale promising new approaches.

- **Build the data infrastructure that accountability requires.** Currently, only 68% of postsecondary student unit record systems connect to workforce

data at all, and just 11% identify the industry and general occupation in which graduates are employed.²³⁰ State agencies have a critical role to play in building and maintaining linked datasets connecting enrollment, completion, and unemployment insurance records in near real-time, and streamlining data-sharing agreements so colleges spend less time on compliance and more on analysis. Workforce Pell implementation is accelerating the pressure to build out comprehensive state data systems. The Workforce Pell Data Framework outlines promising practices for data collection and analysis of employment and education pathways.²³¹

- **Invest in analytic capacity at the institutional and regional level.** State and federal funding should support dedicated labor market intelligence capacity at the institutional or regional consortium level, rather than expecting colleges to absorb this as an unfunded mandate. Dallas College's LMI Center illustrates how a dedicated function can support program alignment, regional workforce analysis, and community decision making. Similarly, multi-college initiatives such as the National Applied Artificial Intelligence Consortium—backed by National Science Foundation and led by Miami Dade College—show how public and philanthropic funding can build shared capacity in fast-moving fields.
- **Reform curriculum approval timelines and create opportunities for program incubation.** Community college curriculum approval processes can take over a year under standard state and accreditation requirements²³²—long enough to virtually ensure that programs in fast-moving fields will be dated by the time students graduate. California's Strong Workforce Program offers a promising example. Through applying process improvement principles, one regional consortium reduced curriculum approval time from 6.6 to 3.2 months,

enabling faster program replication across participating colleges.²³³ Regulatory pathways for rapid credential development, non-credit to credit articulation, and modular credential design should be expanded.

- **Encourage and sustain innovation through funding.** Promising program pilots, including WBL opportunities, and the adoption of new technologies, such as AI-assisted advising tools or integrated data platforms, often require significant startup costs and multi-year investment before they can become part of standard institutional practice. State grants can give colleges flexible capacity-building funds to cover the costs that regular operating budgets may not be able to absorb quickly, including equipment, facilities, software, faculty training, and employer coordination. For example, Texas' Skills Development Fund supports community colleges working with employers to deliver customized training and upskilling, whereas Maryland's Career and Technical Education Innovation Grant supports partnerships among community colleges, workforce boards, and industry stakeholders to build CTE pathways.²³⁴

Employers

Employers are essential partners for community colleges, but for their role to be meaningful, it must be substantive and structured—far beyond periodic advisory input. Across the four decisions that colleges make to align with the labor market and drive growth, there is a clear and distinct role for employers:

- To inform **program portfolio decisions**, employers should help validate whether job demand is real, durable, and local. Colleges need specific information on likely hiring volumes, wages, credential requirements, advancement opportunities, and whether the regional labor market can absorb graduates.
- To support **curriculum design**, employers should help identify the competencies, tools, tasks, and

performance expectations students will encounter in the workplace. They should help faculty and workforce leaders understand how work is changing and partner to develop curriculum-aligned work-based learning opportunities, which can generate positive returns for both businesses and students

- To improve **career navigation**, employers should provide user-friendly insights to help students understand roles, wages, working conditions, and advancement pathways by adopting a “UX mindset”. They can help students build professional networks through mentoring, job shadowing, work-based learning, mock interviews, and guest lectures.
- Employers should support **resource allocation** by sharing some of the cost and risk of the talent pipelines from which they benefit. Co-investment can include equipment, paid internships, apprenticeships, tuition support, faculty externships, shared training facilities, labor market data, guaranteed interviews, or direct financial contributions.
- Lastly, to support **institutional learning**, employers should provide continuous and objective feedback on students' and graduates' competencies after they complete programs. Colleges need to understand whether graduates are being hired, retained, promoted, and prepared for the tasks they encounter.

Conclusion

This playbook offers a practical starting point for colleges to think systematically about building institutional agility and achieving dynamic labor market alignment. However, this field will continue to evolve.

Several questions warrant continued research. As genAI tools become more widely used in advising, job search, and hiring, researchers and practitioners will need to understand how colleges can adopt these tools without amplifying existing inequalities. More work is also needed to identify

what effective career navigation looks like for diverse learners, including adult students, working learners, parents, first-generation students, and students balancing education with caregiving or employment. Finally, the field needs stronger evidence on the organizational capabilities colleges require to sustain agility over time: the staffing models, governance structures, and funding mechanisms that allow institutions to adapt repeatedly without losing sight of their mission.

Community colleges cannot eliminate uncertainty from the future of work, but they can help learners and regions navigate it with greater confidence. In an AI-driven economy, the agile community college will continuously align programs, skills, resources, and supports with changing opportunities in ways that expand economic mobility for the students and communities it serves.

Appendix A: Project Methods and Overview

Phase One: Discovery

Over the course of two years, HPoW researchers and designers at EDL's Community College Growth Engine (CCGE) worked with a cohort of community colleges to understand and support their use of data and technology to improve students' workforce outcomes.

The cohort selection included a scan of states and institutions across regional and economic contexts (i.e. population, income inequality, unemployment), education and economic outcomes (i.e. graduation and retention rate, typical earnings, participation in CCGE), and policy contexts (i.e. community college governance structure, political leaning, funding system, longitudinal data system, and designated CHIPS hub).^{235, 236} The team consulted with experts across education, employment, research, and policy to inform this review and identify promising colleges.

Eight colleges were selected for interviews and each was considered against a set of criteria, including student education and economic mobility outcomes, innovation orientation, leadership commitment to the project, opportunity for impact, and diversity across student and regional dimensions. After conducting interviews and desk research, the team selected four community colleges representing a range of institutions and interest in the initiative.

Phase Two: Research

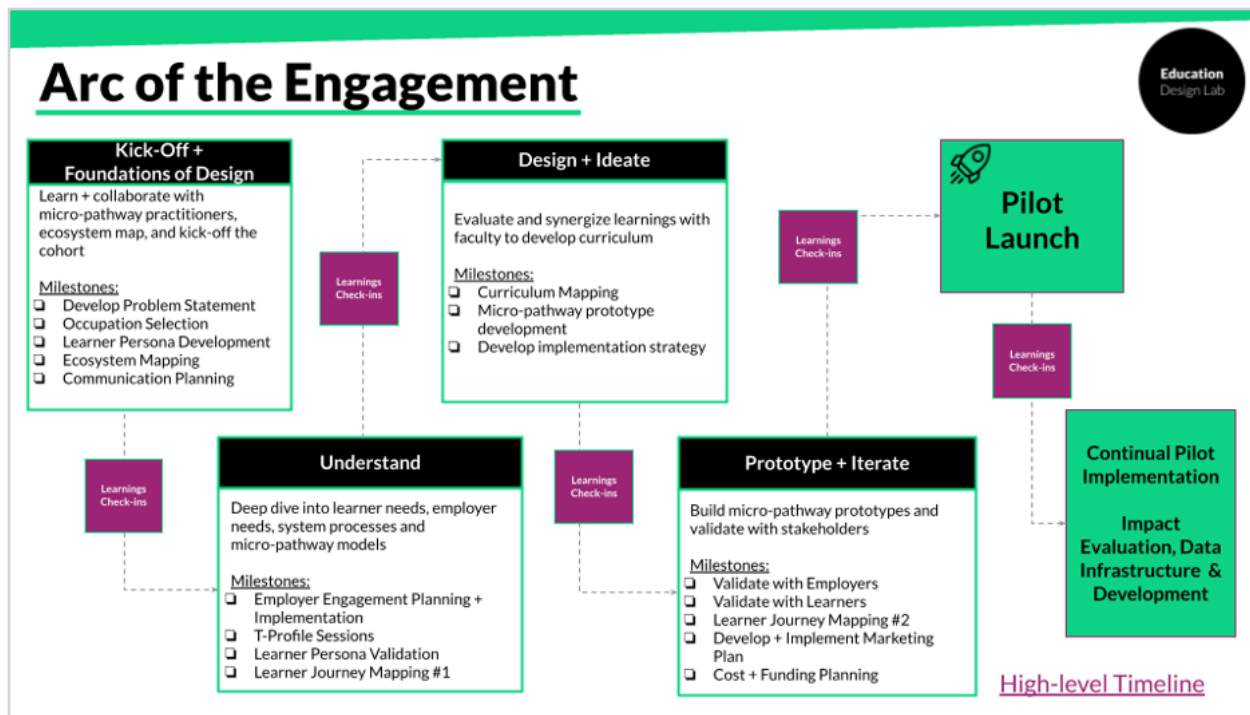
After selecting the cohort of colleges, HPoW placed Harvard researchers within each college for five months to conduct rigorous qualitative research. This involved in-person interviews and focus groups with a range of stakeholders (college leaders, faculty, staff, students, local employers, and policymakers)--reaching nearly

150 individuals across the sites. In addition to interviews, the researchers reviewed institutional documents, field research of existing community and industry partners, and identified promising practices and opportunities for improving the use of data and technology. Four detailed case studies were published in a volume examining models, challenges, and promising practices.

Phase Three: Implementation

In the second phase, an Education Designer from CCGE led a strategic design project with each community college based on findings from their respective case study. CCGE's work follows a four-part design process via immersive sprints based on human-centered design principles and the Lab's Learner Engagement Framework.²³⁷ The college assembled a design team of cross-functional campus leaders, including faculty, administrators from workforce development and continuing education, academic and career advising, as well as institutional research and advancement.

Co-designed with learners and employers, each college design team developed a micro-pathway, defined as "two or more stackable credentials, including a durable skills micro-credential, that are flexibly delivered to be achieved within less than a year and result in job at or above the local median wage, and start learner-earners on the path to an associate degree."²³⁸



Source: Education Design Lab

Phase Four: Playbook Development

This playbook focuses on workforce programs, defined as sub-BA programs (i.e. certificates and/or degrees) in which learners gain work-relevant skills in-service of job training.²³⁹ To ensure this playbook is both valuable and actionable for community college leaders, we leveraged a variety of research strategies, in addition to case study research. We conducted an extensive review of community college research, with a particular focus on literature related to labor market alignment and economic development. Initiatives such as Rutgers Education & Employment Research Center and Aspen College Excellence Program provided foundational research that inspired our work. We hope this publication can build off of their efforts.

In October 2024, we held an invitation-only convening of more than 90 community college presidents and workforce leaders from across the country to share our emerging research, showcase the work of partnered colleges in leveraging data and technology, and solicit feedback on the playbook framework. We conducted a pulse survey of 44 community college leaders to understand where they agreed, disagreed, and prioritized advancing their work. Their results helped us refine our framework and recommendations. We also conducted supplementary interviews with nearly 20 stakeholders across partner colleges and the broader workforce development field.

Appendix B: Example Data Framework (Illustrative)

Example program

Construction Technology AAS @ Community College in KY

Occupation: First-Line Supervisors of Construction Trades and Extraction Workers

Aggregate			
Job Demand	Current employment	Employed:	6,750
		25th percentile wage:	\$21.23
		Median wage:	\$24.78
		75th percentile wage:	\$32.98
		3 year wage growth:	\$1.11
		5 year wage growth:	\$1.28
		10 year wage growth:	\$5.23
	Job postings	All job postings:	728
		Average credential across jobs:	HS Diploma
	Skill	Requirements:	Project management software, active listening, critical thinking, monitoring, complex problem solving
	Job projections	10-year state projections:	10,120 jobs, 3.7% growth
		Theoretical AI exposure:	42%
		Current AI exposure:	11%
Pathways	Work-Based Learning	% participating:	33%
		Median WBL hours:	150
	Advising	% participating:	84%
		Median advising hours:	3
	Completion	Completion rate:	46%
Employment	Employment	Employed at 6 months:	72%
	Employed in field	Employed in field at 6 months:	61%
	Retention rate	Same-employer retained at 2 years:	26%
Earnings	Median earnings	Earnings at 6 months:	\$19.25
		Earnings at 3 years:	\$20.60
	Living wage	% earning living wage at 6 months:	25%
Mobility	Earnings growth	Earning growth at 5 years:	5.2%
		Earning growth at 10 years:	21.1%
	ROI	% with positive ROI after 3 years:	73%

Note: This table is intended to illustrate how colleges might populate the data framework for a specific program, taking the case of an Applied Associate’s degree in construction technology at a community college in Kentucky. The labor market data are drawn from real occupational and regional labor market sources, including BLS Occupational and Employment Wage Statistics (OEWS), US DOL Career Trajectory and Occupational Transitions, KYSTAT,²⁴⁰ and O*NET for occupational skill requirements.

The student outcomes data are all illustrative figures, designed to reflect plausible patterns using available benchmark evidence, including national community college data, research on work-based learning access, and regional labor market context.^{241, 242, 243, 244} None of the data was provided from a specific college. Both the aggregate and disaggregated figures should be filled with institutional student-level records wherever available, including work-based learning participation, advising records, completion, employment and wage-record matches, and longer-term earnings outcomes. Disaggregated figures have not been included, but categories such as income, race, gender, age, first-generation status, veteran status, and enrollment intensity can provide further analysis for opportunity gaps.

Appendix C: Data and Technology Resources

LMI Vendors

Lightcast: Real-time labor market intelligence platform that analyzes job postings, workforce trends, skills demand, wages, and occupational data to support program planning and workforce alignment.

Chmura: Labor market analytics platform providing regional employment projections, workforce demographics, occupation forecasts, and economic impact analysis for strategic academic planning.

Revelio Labs: Workforce intelligence company that collects and aggregates public employment records, job postings, and employee reviews.

Open Data Tools

Workforce Almanac: An interactive directory that maps workforce training providers across the US.

GenAI Adoption Tracker: This tracker reports results from a series of nationally representative surveys on genAI use at work and home.

MIT Work Analytics Lab US AI Exposure Map: This interactive map visualizes labor market and AI exposure data across occupations and regions in the United States.

MIT Cost of Living Calculator: An online tool that provides localized cost-of-living estimates across the United States

National Labor Exchange: A coordinated labor market infrastructure that aggregates, distributes, and shares job opening information across multiple state, employer, and workforce systems.

Federal and State Data Sources

Occupational Employment and Wage Statistics: BLS source for employment and wage estimates across 830 occupations at the national level, state level, metropolitan, and nonmetropolitan areas.

O*NET Online: National occupational database providing detailed information on job skills, competencies, knowledge, work activities, and career pathways.

The Career Trajectories and Occupational Transitions (CTOT): An interactive dashboard provided by the Department of Labor, providing data from nationally representative longitudinal data and online career profiles to capture workers' career trajectory and transitions.

American Community Survey: US Census source for demographic, social, economic, business, and community data used to understand regional populations and workforce trends.

College Scorecard: An online tool from the US Department of Education to compare higher education institutions across college cost, graduation rates, and post-graduate earnings.

Postsecondary Employment Outcomes (PSEO): Federal dataset linking higher education records with earnings data to analyze graduate employment and wage outcomes by institution and academic program.

Integrated Postsecondary Education Data System (IPEDS): National higher education database providing institutional data on enrollment, completion, finance, staffing, tuition, and student outcomes.

Postsecondary Data Partnership (PDP): National survey of higher education institutions providing

data on an array of standardized metrics including enrollment, demographics, and student outcomes.

Work-Based Learning (WBL)

Riipen: Experiential learning platform that connects educators, employers, and students through real-world projects, enabling scalable work-based learning, career readiness, and employer engagement.

Handshake: Career network that connects students with employers through internships, jobs, career fairs, and work-based learning opportunities.

Career Navigation

Navigate360: A student success platform that helps students schedule advising and career appointments.

Handshake AI: AI-powered career platform that personalizes internship, employment, and career recommendations while connecting students with employers.

Lightcast Career Coach: Career exploration platform that connects academic programs to occupations, labor market demand, wages, and in-demand skills, helping students make informed education and career decisions.

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