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USING LABOR MARKET INFORMATION TO BUILD CAREER-CONNECTED PATHWAYS

BUILDING STRONGER LINKS BETWEEN EDUCATION AND WORK OPPORTUNITIES

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PURPOSE & ORGANIZATION

The purpose of this guide is to equip colleges to use labor market information (LMI) to design and sustain career pathways that directly align education with regional workforce demand. Users will find ways to translate key LMI principles, practices, and tools into actionable guidance, demonstrating how labor market data can be interpreted and applied to inform decision-making across all stages of pathway development.

Organized around three core areas of pathway design and implementation, this guide helps faculty, curriculum designers, administrators, advisors, and other college/university staff identify where and how to apply LMI to specific goals. Whether institutions are advancing comprehensive pathway strategies or targeting a particular phase of development, this resource supports more informed, data-driven decisions by clearly connecting LMI to practice.

Each section provides an overview of the core area, resources for further exploration, and examples of how the concepts are applied in practice. In the appendix, users will also find guiding questions to support reflection and application.

INTRODUCTION

What is Labor Market Information?

According to the LMI Institute (2014), labor market information (LMI) refers to "quantitative or qualitative data and analysis related to employment and the workforce" (p. 1). LMI provides projections of changes in the labor market at the job field level, as well as provides information on needed skill levels for particular roles. The purpose of LMI is to help policymakers, practitioners, and job seekers make informed decisions about workforce and economic development planning, investments, and program design.

LMI is used by a wide range of education providers, workforce organizations, and employers to inform decision-making across the education and workforce ecosystem to:

Colleges and Universities

- Guide curriculum and program design.
- Develop work-based learning opportunities.
- Strengthen career navigation.
- Engage employers in meaningful partnerships.

Employers

- Make strategic business decisions (including setting competitive wages, optimizing recruitment, identifying skill gaps, and forecasting future workforce needs).
- Assess local talent supply.
- Understand industry trends.
- Benchmark against competitors to improve hiring and retention.

Workforce Development Boards

- Prioritize regional investments, focusing on growing industries that offer quality jobs and strong career pathways.

Policymakers

- Determine where public investments and policy interventions are most needed.

Economic Development Organizations

- Support business attraction and retention.
- Implement regional economic growth strategies.

Together, these stakeholders use LMI to better align education, workforce, and economic development efforts.

For colleges and universities, LMI is not just a data source, but a strategic tool for aligning education with opportunity.

Students and learners increasingly expect a clear connection between their investment in postsecondary education and meaningful employment outcomes. At the same time, colleges are under growing pressure from policymakers, funders, and accreditors to demonstrate return on investment and workforce relevance. LMI provides the evidence to meet these expectations.

Colleges can use LMI to inform which programs to offer, expand, or reduce capacity by identifying high-demand occupations, projected job growth, and regional hiring trends. This helps institutions prioritize programs that lead to family-sustaining wages and real career opportunities, rather than relying solely on historical enrollment patterns or anecdotal demand.

For colleges, LMI also serves as a powerful engagement tool with employers. Demonstrating knowledge and sharing data on regional workforce needs can act as a "calling card" to initiate and deepen partnerships with industry. By bringing relevant labor market insights to the table, colleges can engage employers in validating demand, co-designing programs, and strengthening work-based learning opportunities—ensuring that programs are not only data-informed but also grounded in real-world practice.

At the program level, LMI helps colleges refine curricula and credential design by identifying the specific skills, competencies, and credentials employers are seeking. When combined with employer input, this ensures that coursework reflects current technologies, practices, and competency expectations, supporting both immediate job readiness and longer-term career mobility.

Finally, LMI enables colleges to communicate value to prospective students. By linking programs to clear labor market outcomes such as employment rates, wages, and career pathways, institutions can better demonstrate how education translates into opportunity. This transparency supports more informed student choice, improves recruitment and retention, and reinforces trust in the institution's offerings.

In this way, LMI enables colleges to set actionable goals and design, validate, and communicate programs aligned with both learner aspirations and labor market demand.

Sources of LMI Data

There are a variety of sources that colleges can draw on to access LMI, each offering distinct strengths (Center for Regional Economic Competitiveness, 2022; LMI Institute, 2014). Like most data sources, it is important to rely on multiple sources to help obtain the most robust picture of the labor market in a particular field. Across these sources, LMI provides insights into key workforce indicators, including employment trends, wages, industry demand, occupational projections, skill requirements, and workforce supply characteristics. Together, these dimensions help colleges understand both the current and future dynamics of the labor market.

Traditional data sources including the Bureau of Labor Statistics (which collects employment and related data on a monthly basis), O*NET Online (a comprehensive U.S. database of occupations, skills, and job requirements, updated on a rolling basis with ongoing data releases typically refreshed several times per year), state labor market agencies, and the U.S. Census Bureau's American Community Survey (ACS).

All of these sources provide reliable, longitudinal data projections on employment trends, demographics, educational attainment, income, and commuting patterns. The ACS, in particular, is an ongoing annual survey that offers rich insight into workforce supply characteristics. These sources are essential for understanding broad economic patterns, long-term occupational projections, wage trends, and shifts in industry demand over time. Moreover, many states have their own offices that produce state-focused reports that are often divided into regions that reflect state policy priorities. In addition to these federal resources, be certain to check relevant state agencies for labor market projections.

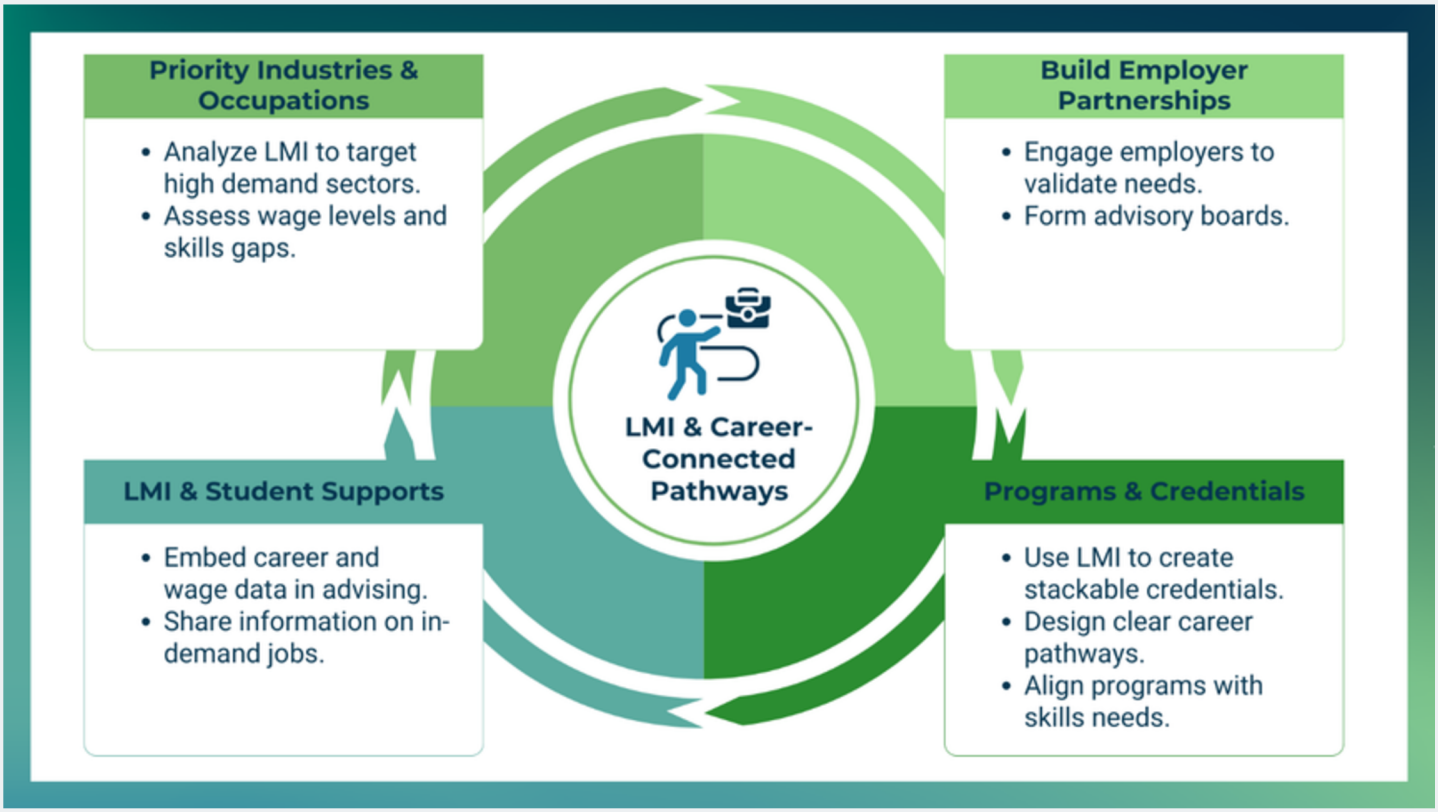
In contrast, real-time labor market data, often derived from job postings analytics tools such as Lightcast™, offers more immediate insight into current employer demand and skill requirements. These tools aggregate data from multiple sources to provide detailed information on job postings, required skills, compensation, worker profiles, and industry and occupational trends. They are particularly useful for analyzing emerging skill needs and near-term hiring activity. While core projected LMI datasets from public sources are typically updated quarterly, job postings data may be refreshed daily, with profile data updated monthly and government dataset integrations occurring throughout the year, allowing institutions to respond more quickly to changing labor market conditions.

However, because real-time data is based on posted job openings, it should be interpreted with caution. Job postings reflect employer behavior as much as actual demand. Some employers may post multiple listings for the same role, keep postings open continuously to build candidate pipelines, or rely on informal hiring channels without posting positions at all. As a result, posting data can either overstate or understate true hiring demand. For this reason, real-time LMI is most effective when paired with traditional data and validated through direct engagement with employers.

Primary data collection by either institutional staff or local economic development groups is also a critical component of a strong LMI strategy. Colleges and universities can gather firsthand insights through employer interviews, industry advisory boards, and targeted surveys to better understand hiring practices, validate skill requirements, and identify emerging trends that may not yet be visible in published datasets.

By combining traditional, real-time, and primary data sources, colleges can develop a more comprehensive and nuanced understanding of workforce needs. This integrated approach enables more informed, responsive, and strategic decision-making in the design and continuous improvement of career-connected pathways.

Why Labor Market Information Matters for Higher Education



Research highlights the growing importance of LMI in aligning education with workforce demand and improving student outcomes (Strada Education Foundation, 2024; Corporation for a Skilled Workforce, 2019). Students increasingly expect a clear connection between postsecondary education and meaningful employment outcomes, and colleges and universities are under growing pressure to demonstrate return on investment and alignment with workforce needs. In this context, labor LMI is an essential tool for designing and strengthening career-connected pathways. LMI includes both quantitative data, including employment trends, job openings, and wages, and qualitative insights, such as employer needs and worker experiences.

Together, these data help answer critical questions:

- What jobs are in demand?
- What skills do employers need?
- What do jobs pay?

Colleges use LMI to make more informed, strategic decisions about program and pathway design. It helps institutions identify priority industries and occupations, determine which programs to launch, expand, or phase out, and ensure that offerings align with regional economic demand. LMI also supports curriculum development by highlighting the specific skills and competencies employers are seeking, enabling colleges to better prepare students for success in the labor market.

Beyond program design, LMI strengthens employer engagement. Data can serve as a starting point for conversations with industry partners, helping colleges build and deepen relationships, validate demand, and co-develop relevant training and work-based learning opportunities.

LMI also plays a critical role in career and academic advising. Advisors can use LMI to guide students toward programs and career pathways that align with their interests and offer strong employment prospects and wage potential. By integrating LMI into advising conversations, colleges can help students understand how different credentials connect to specific occupations, what skills they will need to succeed, and what career progression may look like over time. This supports more informed decision-making, reduces the likelihood that students will enroll in programs with limited labor market value, and helps ensure that students can see a clear, motivating link between their education and future opportunities.

Importantly, LMI enhances how colleges communicate value to prospective and current students. By clearly linking programs to labor market outcomes, including employment opportunities, wages, and career progression, colleges can help students make more informed choices and better understand the potential return on their educational investment.

LMI is a foundational component of effective career-connected pathways, enabling colleges to align education with opportunity, strengthen partnerships, improve advising, and support student success in a rapidly changing economy.

ADDITIONAL RESOURCES:

- Defining Labor Market Information (LMI) and LMI Customers. LMI Institute.
- Understanding Your Community: Labor Market and Workforce Development System Data Toolkit. Corporation for a Skilled Workforce (CSW).
- A Brief Introduction to Labor Market Information (LMI). Center for Regional Economic Competitiveness.
- How to Use Data to Improve Non-Degree Workforce Programs at Community Colleges. New America.
- Emerging Insights into the Use of Labor Market Information in Postsecondary Education. Rutgers School of Management and Labor Relations.

FRAMING CAREER-CONNECTED PATHWAYS

Developing effective career-connected pathways requires more than strong program design; it requires a shared, institution-wide understanding of how education connects to workforce opportunity.

LMI can serve as a critical framing tool by grounding decision-making in data and creating a common language across faculty, staff, and leadership about workforce alignment and student outcomes.

National and regional projections, such as those from the Bureau of Labor Statistics and state labor market information agencies, offer a reliable, shared factual foundation for understanding which industries and occupations are growing, what skills are in demand, and where opportunities exist. When institutions regularly incorporate this data into planning and review processes, it helps ensure that academic and workforce teams are aligned around the same priorities.

Colleges are increasingly embedding LMI into institutional practices to support this shared understanding. LMI also plays an important role in communicating value to students. Providing clear, student-facing data on wages, job outlook, and career progression helps learners understand the return on investment of credential attainment and how their chosen pathway connects to real opportunities in the labor market. This transparency supports better decision-making, strengthens engagement, and reinforces the relevance of career-connected pathways.

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By using LMI as a framing concept, colleges can build a more cohesive, data-informed approach to pathway development, one that aligns institutional strategy, program design, and student experience with the realities of the labor market.

Examples:

South Central College in Minnesota integrates Lightcast™ and SkillPointe™ data into biannual program reviews, equipping program designers with actionable labor market insights to inform program decisions and updates. The college validates the data emerging from these tools via regular check-ins with their employer partners (Corporation for a Skilled Workforce, 2024a).

Grand Rapids Community College in Michigan routinely analyzes employer demand and wage data to guide new program development and strengthen or expand existing offerings. One example is its FutureTech Careers programs. The college partners with West Michigan Works! to gather labor market information (LMI) and conduct wage analysis, then validates those insights through feedback from regional industry councils. The result is a set of data-informed, employer-validated programs that lead to in-demand careers offering competitive wages and clear pathways for advancement (Grand Rapids Community College, 2025a, 2025b).

ADDITIONAL RESOURCES:

- College & Employer Partnership Action Guide. Advancing Community Equity and Upward Mobility.
- How Community Colleges Use Data and Metrics to Advance Equity. Urban Institute.

Using LMI to Drive Career-Connected Pathways and Student Outcomes

LMI also plays a critical role in career and academic advising. Advisors can use LMI to guide students toward programs and career pathways that align with their interests and offer strong employment prospects and wage potential. By integrating LMI into advising conversations, colleges can help students understand how different credentials connect to specific occupations, what skills they will need to succeed, and what career progression may look like over time. This supports more informed decision-making, reduces the likelihood that students will enroll in programs with limited labor market value, and helps ensure that students can see a clear, motivating link between their education and future opportunities.

A systemic approach to LMI use integrates quantitative data with qualitative insights from employers and learners (Jobs for the Future, n.d.; Van Noy et al., 2023). At the same time, disaggregated LMI, broken down by race, gender, geography, and other factors, helps colleges surface equity gaps in access, participation, and outcomes. This allows institutions to design pathways and supports that intentionally address disparities from the outset, rather than retrofitting solutions later. Equally important is combining quantitative LMI with qualitative insights from employers, which provide context on evolving skill needs, hiring practices, and workplace expectations. Gathering insights from students and recent graduates is also critical. These perspectives reveal access to experiential learning, barriers to transition, and whether students feel prepared for their roles. These insights can also highlight whether students are achieving expected wages and identify any disparities across student groups. Together, these sources provide a more complete picture of workforce demand and support system-level planning.

Institutions are also using LMI to build shared understanding and communicate value across the college. Regional projections help align faculty and staff around workforce needs and priorities, while student-facing data on wages and job outlook demonstrates the return on investment of credentials.

In practice, this systemic approach to LMI use can be summarized in three core strategies:

Identifying priorities by using regional data to target high-demand sectors and guide pathway investments	Advancing equity by leveraging dis-aggregated data to design more inclusive systems	Strengthening insights by integrating quantitative data with employer and student input.

Together, these strategies enable colleges to move from isolated efforts to cohesive, data-informed systems that support strong career-connected pathways and improved outcomes for learners and communities.

Examples:

The **Dallas College** Labor Market Intelligence Center researches the local labor market, program alignment, and socioeconomic barriers that impact students. The college recently launched a First Destination Survey to track where graduates go, what they earn, and how their programs connect to employment. Early findings show that graduates in high-demand fields and those whose jobs align with their program of study earn higher wages, with a $13,000 difference between graduates in jobs directly related to their studies and those in unrelated roles. The college uses these insights to inform program development, strengthen employer partnerships, and expand career services for students (Dhaliwal, 2025).

Washington State community colleges partnered with the Community College Research Center to classify career-technical programs as leading to lower- or higher-paying jobs, based on actual graduate earnings.

They then examined student representation across those program tiers by race/ethnicity and gender to identify where underserved students were concentrated in lower-paying pathways (Lin, Fay, & Fink, 2020).

ADDITIONAL RESOURCES:

- Unpacking Program Enrollments and Completions With Equity in Mind. Community College Research Center.
- Making the Most of Labor Market Data for Academic Decision Support. West Virginia University & Downstream Strategies.

Conducting Labor Market Research and Interpreting Career Trends

In order to implement the applications described above, institutions engage in structured activities to access, analyze, and interpret local, state, and national labor market data to inform pathway design.

Effective career-connected pathway design depends on strong labor market research and the ability to interpret career trends over time. This involves engaging in ongoing activities to access and use local, state, and national labor market data to inform decisions. While a range of LMI tools and sources are available, no single source provides a complete picture. Instead, institutions should take a comprehensive and critical approach to analysis.

A key principle is to use LMI as a starting point, not the answer. While labor market data can highlight demand, wages, and growth trends, it is inherently limited and must be validated through employer engagement and stakeholder input.

Real-time tools can surface emerging skills needs more quickly than traditional data sources, while regional insights from workforce boards, economic development reports, and industry associations help ground national trends in a local context.

Effective labor market research is typically guided by three core analytical questions: who is in the workforce and who is not (supply); which occupations are growing and at what wages (demand); and how well existing education and training programs align with these needs (system). Together, these lenses help institutions assess both opportunity and gaps across the workforce ecosystem.

Context also matters. LMI should be interpreted in light of policy priorities, regional economic conditions, and institutional context. For example, a high-demand occupation may not align with a college's mission or may offer wages below a living standard, requiring thoughtful consideration of tradeoffs. Institutions must often weigh factors such as job demand, wage potential, and projected growth, particularly when high-demand roles do not offer strong job quality or advancement opportunities.

Finally, identifying meaningful trends requires clear definitions and consistent analysis. Institutions must determine what constitutes a "trend," like sustained year-over-year job growth, the emergence or decline of specific occupations, or early signals from real-time data indicating shifts in skill demand. By combining multiple data sources, validating findings with employers, and applying a structured analytical approach, colleges can move beyond surface-level insights to produce more accurate and actionable labor market analyses.

Workforce Alignment

Workforce alignment is a critical component of developing effective career-connected pathways, ensuring that programs are directly connected to regional labor market demand and lead to meaningful economic outcomes for students. Conducting labor market analyses allows institutions to identify aligned occupations, understand wage data, and assess growth projections, forming the foundation for strategic decision-making.

A key step in this process is setting pathway priorities LMI helps colleges identify high-growth sectors, in-demand occupations, and the credentials required to access those jobs. By analyzing regional employer demand and industry trends, institutions can focus their program offerings on areas with the greatest employment and advancement opportunities.

Equally important is assessing the economic value of pathways. Wage progression and earnings data provide insight into whether programs lead to family-sustaining wages and long-term career mobility. This allows colleges/universities to evaluate not just whether jobs are available but also whether they offer sufficient compensation and advancement potential to support graduates' economic stability.

Workforce alignment also requires a close examination of how well existing programs match labor market needs. Program-level alignment analysis compares current courses, credentials, and pathways against identified workforce gaps. This process helps institutions identify where programs are well-aligned, where there may be duplication or overlap, and where new or revised offerings are needed to better meet employer demand.

Together, these strategies set priorities, assess economic value, and align programs to demand, enabling colleges to create pathways that are responsive to the labor market, support student success, and contribute to stronger regional economies.

Examples:

Cabrillo College discovered through graduate surveys that many medical assisting students were not finding jobs after completion (Aspen Institute College Excellence Program, 2014). By accessing labor market data from proprietary databases, reaching out to employers, and reviewing the number of medical assistants being produced across the region, the college found that the market was saturated. In response, Cabrillo right-sized the program to better match regional demand. Employer conversations also revealed that graduates lacked foundational English and math skills, prompting the college to redesign the program with increased academic rigor and a shift to a cohort model (Aspen Institute College Excellence Program, 2014).

Durham Technical Community College, **Forsyth Technical Community College**, and **Stanly Community College**, all in North Carolina, have used labor market information to identify high-wage, high-growth occupations to determine which programs to build and how to design or adapt them to ensure learners are able to prepare for career track jobs (Jobs for the Future, 2026).

Lorain County Community College in Ohio developed its Fast Track program by reviewing its credit-based curriculum against regional labor market data to identify short-term certificates that aligned with high-demand industries, including advanced manufacturing, healthcare, IT, and business (Turk, 2024). The college originally identified over 50 potential programs and then narrowed them to 14 using design principles grounded in labor market outcomes, ensuring each credential served as an entry point into industries with strong wages and advancement opportunities (Whitehurst, 2025). Fast Track programs can be completed in 16 weeks or less at no cost, stack into advanced certificates and degrees, and include dedicated career services and employment support. Since launching, more than half of Fast Track completers have returned to LCCC for advanced credentials within 12 months (Turk, 2024), and MDRC and RAND are now partnering with the college to evaluate the program's outcomes more rigorously (MDRC, 2025).

ADDITIONAL RESOURCES:

- How to Use Labor Market Data to Drive Economic Mobility. Jobs for the Future.
- Five Community Colleges Tweak Their Offerings to Match the Local Job Market. The Hechinger Report.

IMPLEMENTING CAREER-ENGAGED STUDENT SUPPORTS

To fully realize the promise of career-connected pathways, colleges and universities may want to embed career navigation throughout the student experience.

This requires a shift toward an integrated approach that ensures students are consistently exposed to career information, guidance, and opportunities from entry through completion and beyond. Leveraging disaggregated demographic data such as race, income, age, and enrollment status as well as student outcomes and labor market information can further strengthen this approach by helping institutions identify equity gaps, tailor support services, and ensure that career navigation strategies are responsive to the diverse needs and experiences of all learners.

Leveraging technology and data systems is another essential component. Colleges can use integrated advising platforms, degree-planning tools, and labor-market data systems to provide real-time, personalized guidance to students. These tools can help track student progress, recommend courses aligned with career goals, and surface relevant job and internship opportunities. When used effectively, technology enables more proactive, data-informed support and improves the consistency and scalability of advising.

These strategies create a more cohesive, student-centered system, one in which career exploration, advising, technology, and employer engagement work in concert to support informed decision-making, persistence, and successful transitions into the workforce.

Leveraging LMI to Tailor Student Supports

Colleges are increasingly using student and community demographic data such as age, race/ethnicity, parental status, enrollment intensity, and income to design more responsive and learner support systems. Rather than treating these data as descriptive, institutions are applying them to embed supports directly into students' educational and career pathways.

Effective supports are those that are intentionally integrated into pathways and tailored to learners' goals and circumstances, providing the information, resources, and options needed to navigate education and employment systems (Credential As You Go, 2024).

In practice, colleges are using demographic data in several key ways:

- **Targeting supports based on student characteristics and life circumstances**: Institutions analyze who their students are (e.g., working adults, part-time enrollees, and student parents) to design
- **Addressing gaps in access and outcomes**: Disaggregated data by race, income, and enrollment status helps colleges identify disparities in retention, completion, and career outcomes. These insights inform targeted interventions, resource allocation, and pathway redesign.
- **Integrating academic, career, and basic needs supports**: Recognizing that students' success is shaped by factors beyond academics, colleges are embedding advising, career navigation, and basic needs support into a coordinated system rather than offering them as disconnected services.
- **Aligning supports with community context**: Community-level demographic and economic data inform program design, partnerships, and service delivery ensuring supports reflect local workforce conditions and the realities students face outside the classroom.
- **Designing learner-centered pathways**: Demographic insights help institutions tailor pathways to different learner groups, ensuring that programs are accessible, navigable, and aligned with both student goals and labor market opportunities.

Example:

A majority of students at **Hudson County Community College** in New Jersey experience basic needs challenges, with over two-thirds reporting recent food insecurity and nearly half facing housing instability (The Project on Workforce and Education Design Lab, 2025). In response, the college created the Hudson Helps Resource Center as a centralized hub offering supports such as food access, technology loans, career clothing, and mental health services. Hudson is also participating in Generation Hope's FamilyU initiative to better support student parents, including updating policies, improving data collection, adding a dedicated Student Parent Fellow, and providing priority registration to help balance academic and family responsibilities.

ADDITIONAL RESOURCES:

- Data and Technology in Action: Community Colleges Advancing Economic Mobility. The Project on Workforce & Education Design Lab.
- Learner Supports Playbook. Credential As You Go.

Embracing Career-Informed Advising

Central to effective career-connected pathways is embracing career-informed advising. Advisors play a critical role in helping students connect their academic choices to real-world labor market outcomes. By incorporating LMI, wage data, and career pathway insights into advising conversations, colleges can guide students toward programs that align with both their interests and strong employment prospects. This approach helps students better understand the skills they are developing, the credentials they are earning, and the opportunities available to them at each stage of their journey.

To support this work, institutions are developing tools and systems that enable more informed, data-driven advising. Integrating job outlook, salary data, and career progression information into advising platforms allows students to make evidence-based decisions about majors and programs of study. These tools move advising beyond course selection to a more holistic conversation about long-term goals, economic mobility, and career advancement.

Importantly, career-informed advising also plays a role in advancing equity. Disaggregated LMI, broken out by race, gender, geography, and other factors, can surface disparities in representation across high-wage and high-growth fields. Equipped with this information, advisors can proactively support students in navigating barriers, expanding their awareness of opportunities, and accessing pathways that may have been historically underrepresented.

By embracing career-informed advising, colleges can ensure that students are not only progressing academically but also making intentional, informed decisions that position them for long-term success in the labor market.

Examples:

The **University of Florida** integrates occupational outlook and wage data directly into its career advising platform, enabling students to explore career options and understand their potential outcomes as part of the advising process (University of Florida Career Connections Center, n.d.).

Northern Virginia Community College (NOVA) has created a career exploration tool that brings in data from Lightcast™, O*NET Online and others to help support students in selecting a career pathway (Palmer, 2024).

Monroe Community College in New York provides a set of interactive tools to help students explore majors and careers, learn about local data on wages, the employment outlook and what credentials are needed to enter and advance in a career (Palmer, 2024).

Bakersfield College organizes each program in its catalog by term, from entry to completion, and includes career outcomes, wage data, and labor market demand in every pathway. After the tool's launch, the percentage of on-path coursework among first-time students increased from 63% to 78% (Karandjeff, Dadgar, & White, 2020). Students who used the Program Pathways Mapper were nearly twice as likely to complete their degree within three years.

Montgomery County Community College uses a proprietary labor market application to help undecided students explore occupations, earning potential, and projected job opportunities in their region. Faculty and staff embed the tool across multiple student touchpoints, referencing it in orientation materials, advising handouts, and one-on-one counseling appointments as a springboard for career-focused conversations (Aspen Institute College Excellence Program, 2014).

ADDITIONAL RESOURCES:

- What is Labor Market Information and How Can Community Colleges Use It?. Data Quality Campaign.
- On Path and In Control: Early Results on How Bakersfield College Students Experience Program Mapper. The RP Group.
- Using Labor Market Data to Improve Student Success. The Aspen Institute.

Leveraging Technology and Data Systems

Leveraging technology and data systems is essential to scaling career-connected pathways and ensuring that students receive timely, relevant, and personalized guidance. When thoughtfully integrated, technology enables colleges to connect student interests and experiences with real-time labor market demand, while also equipping institutions with the data needed to improve programs and supports continuously.

Career assessment tools play an important role when paired with real-time job postings analytics. By linking students' interests, strengths, and preferences with current employer demand in the region, colleges can help students see clear and realistic pathways forward. This combination of self-exploration and labor market insight strengthens alignment between student goals and workforce opportunities, making career decision-making more concrete and actionable.

At the institutional level, integrating career tools into existing systems, like advising platforms, learning management systems, and student information systems, allows for more seamless and consistent use of data across the student experience. Data dashboards that combine institutional outcomes (such as enrollment, retention, and completion) with regional LMI enable institutions to monitor program alignment and identify areas for improvement continuously. These systems support more proactive decision-making by providing real-time or near-real-time insights into student progress and workforce relevance.

Shared data infrastructure is also critical. Connecting with workforce boards, economic development organizations, and regional research institutions allows for more timely and comprehensive analysis of labor market trends. This cross-system collaboration strengthens the accuracy and usefulness of data, ensuring that institutions are working from a common, up-to-date understanding of regional workforce needs.

To fully leverage these tools, institutions must also build internal data literacy. Faculty, advisors, and administrators need training and support to interpret LMI and apply it effectively in program design, advising, and strategic planning. Without this capacity, even the most sophisticated data systems will have limited impact.

By leveraging technology and data systems in these ways, colleges and universities can create more responsive, data-informed environments that support student success, strengthen program alignment, and drive continuous improvement across career-connected pathways.

Examples:

Reynolds Community College uses innovative dashboards that track enrollment, retention, and completion in real time, disaggregated by school, program, demographics, and geography, enabling more targeted interventions and decision-making (Corporation for a Skilled Workforce, 2024a).

City Colleges of Chicago have partnered with AIR's PROMISE Center to develop sector strategy dashboards that support alignment between education programs and workforce needs (Corporation for a Skilled Workforce, 2024a).

Expanding Employer Connections and Experiential Learning

Expanding employer connections and experiential learning opportunities is critical to making career pathways tangible for students. Internships, apprenticeships, project-based learning, and other forms of work-based learning allow students to apply their skills in real-world settings, build professional networks, and gain a clearer understanding of workplace expectations. When these experiences align with industry needs, they not only enhance learning but also create direct pathways to employment.

A key starting point for institutions is strengthening relationships with employers and using those partnerships to inform both curriculum and student opportunities. This includes systematically inventorying existing employer connections and identifying gaps where additional partnerships are needed to expand access to experiential learning. By taking a more intentional, data-informed approach, colleges can ensure that opportunities are equitably distributed and aligned with high-demand fields.

These partnerships are strongest when they move beyond transactional engagement to true co-creation, where employers actively contribute to curriculum development, program review, and classroom learning experiences.

LMI plays an important role in enabling this kind of collaboration. Institutions can use regional labor market analyses to identify priority sectors and high-demand occupations and then use those findings to guide which clusters of employers to build relationships with. This allows institutions to focus their outreach and partnership development in the areas where demand is strongest and where students have the most promising opportunities ahead of them.

LMI also strengthens the quality of employer engagement by providing a shared, evidence-based foundation for collaboration. Rather than relying solely on anecdotal input, institutions can use LMI to ground advisory board discussions in trends related to demand, wages, and skill requirements, making those conversations more rigorous and productive. At the same time, employer partners play a critical role in interpreting LMI and adding context that data alone cannot provide. Through interviews, surveys, and ongoing engagement, employers contribute insights into hiring practices, emerging skill needs, and workplace expectations. This combination of quantitative LMI and qualitative employer input creates a more complete and actionable understanding of workforce demand.

LMI can help institutions identify where work-based learning opportunities like internships and apprenticeships are most concentrated by looking at placement data. This allows institutions to target placements strategically in sectors with strong demand and growth potential. Real-time job posting analytics further enhance this effort by identifying the skills employers are actively seeking, helping institutions prioritize partnerships with industries and employers that align with current hiring trends.

Effective partnerships also support continuous program improvement. By monitoring key outcomes, including job placement rates, graduate wages, and employer satisfaction, and comparing them to regional LMI benchmarks, colleges and universities can assess how well their programs are performing relative to labor market conditions. This creates an ongoing feedback loop where employer input and labor market data inform program adjustments, and program outcomes, in turn, strengthen employer trust and engagement.

By expanding employer connections, grounding partnerships in both data and practice, and scaling experiential learning opportunities, institutions can deepen the relevance of their programs, strengthen student outcomes, and build stronger, more responsive relationships with regional employers.

Examples:

Reynolds Community College expanded its health care program offerings after receiving $924,000 in federal funding in 2024 to modernize laboratory spaces, purchase new equipment, and boost enrollment in high-demand health programs. The college has a long-standing partnership with VCU Health, including a clinical medical assistant FastForward program through which approximately 200 students have secured full-time positions at VCU Health, with nearly all coming from low-income backgrounds (Moomaw, 2025). In December 2024, Reynolds graduated its first cohort of surgical technology students, and the college recently received additional federal FIPSE funding to double the number of clinical medical assistants and nurse assistants trained each year in partnership with VCU Health (Reynolds Community College, 2026).

Benjamin Franklin Cummings Institute of Technology received a $100,000 grant from the Johnson Controls Community College Partnership Program to expand its HVAC&R Technology certificate program, which focuses on clean energy careers. The college was one of just 10 selected across North America for the grant, which is renewable for up to three years. The partnership came as enrollment in the HVAC&R program had already doubled over the prior few years, reflecting growing demand for technicians in the clean energy sector. Johnson Controls also provides $2,500 scholarships for up to 24 low-income students in the program annually. The college has since launched a broader Center for Energy Efficiency and the Trades, supported by $2.5 million in state funding and federal Good Jobs Challenge grants, and has partnered with additional industry leaders including National Grid and Schneider Electric to co-develop curriculum and connect students to internships and employment (Benjamin Franklin Cummings Institute of Technology, 2022; 2023).

ADDITIONAL RESOURCES:

- How Community Colleges & Their Workforce Teams Are Improving Employer Engagement. Corporation for a Skilled Workforce (CSW).
- Ivy Tech Community College Partners with Unions, Industry for Workforce Training. Government Technology.
- College & Employer Partnership Action Guide. ACE UP & Corporation for a Skilled Workforce (CSW).

BRIDGING ACADEMIC PATHWAYS AND CAREERS

Bridging academic pathways and careers requires intentional alignment between what students learn and what the workforce demands.

This means engaging faculty as partners in career-connected curriculum design, building academic programs with clear career outcomes, embedding industry-relevant skills across coursework, and developing strong employer partnerships that go beyond surface-level engagement.

LMI supports each of these efforts by providing evidence that grounds academic decisions in workforce realities. It can inform how faculty update course content, how institutions sequence stackable credentials, how programs identify the competencies that matter most to employers, and how colleges structure industry partnerships. Across all of these areas, LMI helps ensure that academic pathways are not only rigorous but also relevant and responsive to the labor market.

The strategies in this section explore how colleges can strengthen the connection between academic programming and career outcomes, with examples of institutions already doing this work in practice.

Engaging Faculty as Key Partners and Leaders

Faculty are essential partners in designing and sustaining career-connected pathways. Their leadership in curriculum development, instruction, and program innovation positions them at the center of efforts to align education with workforce outcomes.

Engaging faculty as active contributors requires intentional strategies, including professional development, access to relevant data, opportunities for applied research, and recognition of their role in advancing career-connected learning.

A foundational step is to build a shared understanding of workforce alignment using LMI. Sharing data on occupational projections, emerging skill demands, and employer expectations helps faculty see how their disciplines connect to evolving labor market needs. This shared context supports more informed decisions about course content, program design, and learning outcomes.

Tools such as job posting analytics and competency mapping, along with structured approaches like DACUM (Developing A Curriculum) processes, provide faculty with concrete, current evidence to update curricula.

At the same time, institutions can reduce the burden on individual faculty by providing institutional research support that translates complex LMI into accessible, department-level insights. Rather than expecting faculty to independently interpret large datasets, institutions can offer curated analyses, dashboards, and facilitated discussions that make the data actionable and directly applicable to program improvement.

Engaging faculty also means recognizing and valuing their role in connecting academic learning to career pathways. This can include supporting faculty-led research on workforce trends, incorporating career-connected outcomes into evaluation and recognition systems, and creating opportunities for collaboration with employers and workforce partners (ATD AI for All Task Force, 2025).

Institutions are increasingly using a range of incentives to support faculty participation in career-connected work. These include offering course release time to allow faculty to redesign curriculum or engage with industry partners, providing stipends for participating in pathway design or work-based learning initiatives, and investing in professional development focused on LMI, employer engagement, and applied pedagogy.

For example, colleges participating in initiatives such as Achieving the Dream have provided stipends and structured professional learning to support faculty in integrating career and workforce relevance into courses, while City Colleges of Chicago has supported faculty engagement in career pathway redesign through dedicated time and cross-functional collaboration with employers (American Institutes for Research, 2024). Similarly, guidance from Credential As You Go emphasizes the importance of equipping faculty with both the time and resources needed to embed credentials and career relevance into programs. Together, these approaches recognize that faculty engagement is critical—and that meaningful participation requires intentional investment in time, capacity, and professional learning.

By positioning faculty as key partners and leaders, colleges can ensure that career-connected pathways are not an add-on, but an integrated and sustainable part of the academic enterprise.

Integrating Career-Focused Skills and Competencies Across Curriculum

Once faculty are engaged and equipped with the right tools and data, the next step is embedding industry-recognized skills and competencies across the curriculum, ensuring that what students learn is directly aligned with workforce expectations. This goes beyond individual courses to a more intentional, program-wide approach where competencies are integrated into course outcomes and reinforced through applied learning experiences.

LMI plays a critical role in identifying which skills matter most. Job posting analytics provide real-time insight into the technical skills, transferable (durable) skills, and emerging competencies that employers are actively seeking. Complementing this, O*NET offers structured occupational data, including detailed competency and task profiles, which help anchor curriculum updates to widely recognized industry standards.

Processes like DACUM and competency mapping further strengthen this alignment. When informed by LMI and employer input, these approaches translate workforce needs into specific, measurable learning outcomes at the course level.

Colleges and universities are advancing this work in a variety of ways. By systematically integrating career-focused competencies across the curriculum, they can create more relevant, responsive learning experiences that prepare students for success in both immediate employment and long-term career advancement.

Examples:

Eastern Connecticut State University used real-time job posting data to identify the skills employers value most in their graduates. Faculty integrated those competencies into academic programs, strengthening alignment between curriculum and workforce demand (Van Noy et al., 2023).

Collin College developed the Business and Industry Leadership Team (BILT) model, which brings together industry leaders and faculty to systematically identify the knowledge, skills, and abilities most needed in the workforce. Faculty then review those recommendations and embed them into the curriculum (Strada Education Foundation, 2025). **South Central College** in Minnesota has also adopted the BILT model to ensure employer partners co-lead program decisions and that curriculum stays aligned with emerging workforce needs (Corporation for a Skilled Workforce, 2024a; Pathways to Innovation, n.d.).

ADDITIONAL RESOURCES:

- Employer and Community College Partnerships: Models and Practices for Supporting Students and Strengthening the Workforce. Strada Education Foundation.
- Emerging Insights into the Use of Labor Market Information in Postsecondary Education. Rutgers Education and Employment Research Center.

Redesigning Academic Pathways with Clear Career Outcomes

Redesigning academic pathways to include clear career outcomes is essential for helping students understand how their education translates into opportunity. This work involves developing structured, term-by-term program maps that integrate academic coursework with embedded credentials, work-based learning experiences, and defined career milestones. These maps provide students with a transparent roadmap—from entry to completion and beyond—highlighting both educational progression and corresponding workforce opportunities.

LMI plays a critical role in informing this redesign. By clarifying which credentials align with entry-level, mid-career, and advanced roles, LMI helps institutions sequence certificates and degrees in ways that reflect real occupational pathways. This ensures that each step along the pathway has labor market value and contributes to longer-term career mobility.

Career pathway maps are strengthened when built using wage ladders, employer requirements, and industry growth trends. These maps illustrate not only how students can enter a field, but also how they can advance over time, including the credentials, skills, and experiences needed at each stage. This approach helps students see both immediate and long-term returns on their educational investment.

Stackable credential design is another key component of pathway redesign. By leveraging employer feedback and job postings analysis, colleges can identify which credentials are recognized and valued at different career stages. This enables institutions to design programs where shorter-term credentials build toward larger degrees, allowing students to earn meaningful milestones along the way while maintaining momentum toward advanced credentials.

By redesigning academic pathways with clear career outcomes, colleges can create more transparent, flexible, and aligned systems that support student success, meet employer needs, and advance economic mobility.

Examples:

Rockland Community College's Faculty Innovation Fellowship supports faculty in designing stackable pathways that integrate workforce programs with credit-bearing degrees, creating more flexible and career-aligned options for students. The college's micro-pathways work focuses on high-demand fields identified through regional workforce analysis, and pathways are co-designed with employers to lead to jobs at or above the local median wage (Education Design Lab, 2023).

Portland Community College redesigned its health care offerings into five stackable pathways, including Medical Office, Nursing, Medical and Physician Support, Emergency Medicine, and others, using a credential ladder that tied student learning outcomes to expected industry competencies at each level, so students could see how completing one credential led to a higher credential and a higher-paying job (Miller et al., 2021).

ADDITIONAL RESOURCES:

- Designing and Delivering Career Pathways at Community Colleges: A Practice Guide for Educators. National Center for Education Evaluation, Institute of Education Sciences.
- Improving Academic Pathways: Workcred Releases Resources for Community Colleges. American National Standards Institute.

CONCLUSION

LMI is not simply a tool for analysis. It is a catalyst for transformation.

When used effectively, LMI enables colleges to move from isolated program decisions to cohesive, institution-wide strategies that align education with workforce opportunity. This guide has outlined how LMI can be applied across all aspects of career-connected pathway design and implementation, from setting priorities and aligning programs to strengthening advising, embedding career exploration, leveraging technology, engaging faculty, and deepening employer partnerships.

A central takeaway is that LMI is most powerful when it is integrated, contextualized, and acted upon. No single data source provides all the answers. The best approach for colleges and universities is to combine traditional and real-time data with employer input and institutional insight to develop a complete picture of workforce demand. Equally important is building internal capacity, ensuring that faculty, advisors, and leaders can interpret and apply LMI in ways that improve student outcomes.

The examples throughout this guide demonstrate that higher education institutions across the country are already using LMI to redesign programs, expand experiential learning, and create clearer, more equitable pathways to quality jobs. These efforts show that aligning education with the labor market is not about reacting to data alone, but about using it strategically to inform decisions, engage partners, and support students.

Ultimately, the goal of using LMI is to create transparent, relevant, and responsive pathways that help students see where they are going, understand how to get there, and achieve meaningful economic mobility. By embedding LMI into institutional practice, colleges can strengthen their role as engines of opportunity, ensuring that learners are prepared not just for their first job, but for long-term career success in a rapidly changing economy.

APPENDIX

Key Questions to Consider in Applying Labor Market Information for Career-Connected Pathways

Interpreting LMI in Your Context (What does this mean here?)

- What stands out most in the LMI for your region—and why?
- Which occupations or sectors feel most relevant to your institution's mission and programs?
- Where does the data align—or not align—with what you expected?
- What feels unclear or incomplete in the data?

Alignment with Current Programs (What do we already do?)

- Which of your current programs clearly align with the LMI? Where are you well-positioned?
- Where are there gaps between what the LMI suggests and what you currently offer?
- Are there programs that may need to be strengthened, redesigned, or reconsidered based on this data?
- How well do your current credentials signal the skills employers are seeking in these areas?

Learner Fit & Access (Who benefits—and who might be left out?)

- Which learners (e.g., adult learners, veterans, STARs, first-gen students) are best positioned to access these opportunities?
- Where might learners face barriers (entry requirements, cost, time, geography)?
- Do the "high-demand" roles identified also meet your definition of quality jobs (wages, stability, advancement)?
- Are there important roles that may not show up strongly in LMI but are critical for your community?

Employer & Ecosystem Validation (Is this true on the ground?)

- How does this LMI compare to what you're hearing from local employers?
- Which employers or partners should you engage to validate or interpret this data?
- Are there emerging trends or skill needs not yet reflected in the data?

Prioritization & Tradeoffs (What do we focus on?)

- Given limited resources, how should you prioritize: high wages, high demand, equity impact, or strategic fit?
- Are there “high-demand, low-wage” roles you should still invest in? Under what conditions (e.g., clear advancement pathways)?
- What criteria should you use as a team to decide where to focus?

Action & Next Steps (What will we do differently?)

- Based on this discussion, what is one opportunity you should explore further?
- What is one immediate action you can take (e.g., employer outreach, program review, data deep dive)?
- What additional data or information do you need to move forward?
- Who internally needs to be engaged to act on these insights?

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