Pathways to Implementation

Building and Sustaining Effective Career Pathways

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Data

What Is Data, and Why Is It Important for Career Pathways Implementation?

Effective policy implementation requires both a robust data infrastructure and a strong data strategy. The state's data infrastructure must support the gathering, sharing, access, and use of data for decision-making and continuous improvement.[1] To make effective use of the infrastructure, state leaders must develop a data strategy to identify necessary data elements, set up reporting requirements, establish data access processes, and ensure appropriate analytical capacity.[2] For career pathways, an effective data infrastructure and strategy allows stakeholders to assess how well the design of the program is supporting the attainment of the goals set out in the vision for the program.

State leaders and national experts identified the following as core characteristics of effective data systems for career pathways initiatives:

- **Shares data across systems**: Tracking and analyzing career pathways program outcomes requires connecting data from multiple state systems; strong data-sharing agreements can simplify the process. States that have worked across K-12, postsecondary, and workforce to develop longitudinal data systems may have an easier time tracking the necessary data to inform career pathways.[3]

SERIES OVERVIEW

As the needs of the U.S. workforce change, states have sought to improve educational and career outcomes for students by investing in the development of career pathways.[4] Career pathways programs allow high school students to access postsecondary education and employment opportunities, work-based learning experiences, skill-building in alignment with academic content and high-demand occupations, and opportunities to earn credentials before graduation.[5]

To effectively change students' experiences and outcomes, strong policy must be coupled with robust implementation. In Pathways to Implementation, Bellwether draws on nearly 40 interviews with leaders and experts across 14 states to highlight innovative strategies and effective models in career pathways policy, implementation, and programming, as well as challenges states encounter in this work. The series is organized thematically into seven briefs, each addressing one of the key elements of Bellwether's framework for career pathways policy implementation:

1. Vision
2. Design
3. Stakeholder Engagement
4. Resources
5. Communications
6. Data
7. Continuous Improvement

Each brief defines the key framework element, articulates common challenges to state implementation, provides examples of successful state action, and concludes with considerations for state leaders and policymakers.

- **Ensures data interoperability**: Since career pathways engage with state-level data systems across multiple sectors (K-12, postsecondary, and workforce) as well as with federal data systems, it is critical that data are not only robust within individual systems but also able to communicate effectively across systems.[6]

- **Establishes cross-agency governance structures**: To ensure coordination across all stakeholders that have decision-making authority over state data systems, it is critical to pair robust data infrastructure with cross-agency (K-12, postsecondary, and workforce) governance structures that are established in policy and implemented with fidelity.[7]

- **Collects metrics aligned with attainment goals**: State leaders across agencies need to agree on the goals of the career pathways program, identify which data elements would be most useful for determining success, figure out which data are already available for analysis, limit additional asks to what is necessary to support the goals of the program, and use existing data analytics capacity whenever possible.[8]

- **Attends to issues of data access, analytics, and use**: Collected data will not get used unless data capacity is available to conduct analyses and inform program improvement. State agencies often lack this capacity, but partner organizations, including employers, postsecondary institutions, community organizations, and intermediaries, can support some of these needs.[9]

What Gets in the Way of Data, and How Are States Making It Work?

The ability to track and analyze data on program participants is critical to the implementation process, as it not only allows stakeholders to determine the success of a program but also provides the basis for engaging in continuous improvement. But gathering, analyzing, reporting, and using data is difficult and time-consuming, and a lot can get in the way. State leaders and national experts described the following common challenges to developing and maintaining a robust data infrastructure and strategy for career pathways:

- **Lack of infrastructure**: If a state is missing modernized data systems for individual sectors (K-12, postsecondary, and/or workforce), or if state leaders have not developed data-sharing agreements to connect education and workforce data, it will be difficult to track the outcomes of career pathways initiatives.

- **Lack of governance**: If data structures exist, but the state has not established a statewide data governance body, it will be difficult to make cohesive decisions across data systems related to definitions, access, and use.

- **Lack of longitudinal data**: It is challenging to track pathways initiatives if the state has not historically collected data across cohorts of students, over time, across transition points such as high school to postsecondary, and workforce development to work, among others, or disaggregated those data by student group.

- **Lack of accountability structures**: The accuracy and utility of data gathered to track the effects of an initiative are highly dependent upon whether the entities requested to gather and analyze data are appropriately resourced to comply, and whether they are appropriately held accountable for reporting in a comprehensive and timely way.

- **Lack of reasonable access**: The best data will be rendered useless if they cannot be accessed. While protection of student privacy is vital, key stakeholders who are responsible for continuous improvement need to be able to responsibly access outcomes data related to the initiative.

While these challenges are common across states, leaders and stakeholders in **Kentucky**, **Pennsylvania**, and **Colorado** have successfully developed processes to establish and maintain effective data systems for career pathways.

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Kentucky

Established a Robust Statewide Infrastructure

Kentucky's Senate Bill 1, passed in 2009, laid the groundwork for strong investment in college and career readiness and collaboration between the Kentucky Department of Education and the Council on Postsecondary Education.[10] It also led to the creation of the Kentucky P-20 Data Collaborative, whose work is now carried out by the Kentucky Center for Statistics (KYSTATS).[11] Brigitte Blom, president and CEO of the Prichard Committee for Academic Excellence, spoke about the importance of KYSTATS, saying, "KYSTATS, the coordination between the Department of Education and the Council on Postsecondary Education, and the richness of the data going into the state longitudinal data system created a foundation for conversation statewide and for districts to begin to develop pathways in a way that we didn't have prior." KYSTATS became the anchor for the **state's robust data infrastructure** but worked closely with other state agencies to ensure alignment in vision and to communicate important learnings across (and outside of) the government.

Prioritized Purposeful Data Access

Experts who contributed to the creation of KYSTATS focused on ensuring that data were not only connected across systems but that they were also **available to anyone who wished to access them**. Kate Akers, the vice president of policy implementation and best practices at the Data Quality Campaign who previously led KYSTATS, said, "You can go to the KYSTATS website right now, and you can see that the vast majority of [its] work is made to be consumable by any member of the public. We didn't have special access that only legislators could see, or that only school leaders could see." The KYSTATS team also used their **strong data analytics capacity** to create interactive, user-friendly reports for the public, responsive to questions to which stakeholders were seeking answers. In doing so, they lowered barriers for families and community members to access and understand key student metrics and outcomes data.

Pennsylvania

Developed Common Definitions

Leaders in Pennsylvania devoted significant time to **aligning on shared definitions**, critical in this work for comparing the same types of data. For example, the chief data officer for the Pennsylvania State System of Higher Education (PASSHE), Natalie Cartwright, noted that many common terms are not federally defined, such as first-generation student. She explained, "While these terms may seem simple and straightforward at first glance, the nuances behind them are critical. Without consensus on their definitions, it becomes impossible to ensure a valid comparison." Agreeing on common definitions allows government leaders to engage in conversations using the same foundational information, even across agencies, decreasing the chance that data gets lost in translation.

Created Public-Facing Dashboards

Pennsylvania's data experts created and maintain **accessible dashboards for the public** that disaggregate and visualize data across regions of the state, demographics, and credentials.[12] Cartwright shared, "Our publicly available dashboards provide a clear illustration of our commitment to data transparency, offering insight into the openness and accessibility of the information we present." For example, the PASSHE website hosts a dashboard on workforce outcomes, which offers data on median wages post-graduation, employment rates, and employment outcomes by major.[13] The focus on data transparency was a key part of PASSHE's System Redesign initiative — aimed at improving student access and success — which was prompted by stakeholders, including its board and state legislators.[14]

Colorado

Ensured Utility Through Internal and External Partnerships

Interviewees in Colorado emphasized the importance of **shared work around data governance and analysis**. At the state level, agencies would take the lead on the data they knew best and had the resources and skills to analyze, and then other agencies would follow their lead. Sarah Heath, the vice chancellor of academic and student affairs for the Colorado Community College System, explained, "We've tried to be intentional around data: who has the resources, the talent, and the expertise to analyze the data points we need to align to. ... [This ensures] we're all reviewing the same thing in the same way." This strategy helps eliminate confusion among responsibilities for critical data components.

Colorado is also home to a robust nonprofit sector that actively engages in this work. The Common Sense Institute relies on its in-house economists to publish their own data reports, including a new skills report that looks at the future of the economy in Colorado and how it aligns to the credentials and degrees currently being produced by the state's postsecondary system.[15] But the institute's leader also recognized that **Colorado's data infrastructure allowed for the organization to conduct this important data analysis**. Kelly Caufield, the executive director of the Common Sense Institute in Colorado, shared: "[Our most recent skills report] took us about a year to do and had never been done in Colorado before. ... The data systems in Colorado allowed us to answer this postsecondary alignment research question. Colorado had strong postsecondary employment outcome data as well as occupational forecasts, making it possible."

The state's Workforce Development Council also publishes an annual Talent Pipeline Report that is **used by stakeholders to understand and engage in conversation around the state's economic needs**.[16] Scott Laband, president of Colorado Succeeds, spoke

about the importance of that report for advocates in the state. He said, "The Talent Pipeline Report has been a galvanizing tool in our state. It comes out of the Workforce Development Council, and every year, [Colorado Succeeds] helps bring employers into that conversation around what are the top jobs in our state."

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—SARAH HEATH, VICE CHANCELLOR OF ACADEMIC AND STUDENT AFFAIRS, COLORADO COMMUNITY COLLEGE SYSTEM

Pursued Legislative Action for Longitudinal Data

While Colorado has a legal framework that allows for data sharing across systems, the state does not currently have a statewide longitudinal data system.[17] The state legislature is working to change that.

In 2024, it passed House Bill 24-1364, legislation focused on workforce readiness.[18] The bill requires the Governor's Office of Information Technology to build a state longitudinal data system and invested $5 million to achieve that goal. The legislation also created the Colorado state longitudinal data system governing board, which will oversee and guide the creation of the new system. The content of the bill stemmed from recommendations made by the legislatively created Secondary, Postsecondary and Work-Based Learning Integration Task Force.[19] In particular, **the creation of a longitudinal data system in Colorado** aims to help answer frequent questions from stakeholders about the return on investment of specific postsecondary programs.

Data: Considerations for State Leaders and Policymakers

As they seek to establish a robust **data** infrastructure for career pathways implementation, state agency leaders and policymakers should consider the following critical questions.

Existing Systems — How will you ...

- Assess the capacity of the state's existing data system to support the career pathways initiative?
- Ensure the state's data infrastructure is robust and covers all necessary sectors (early childhood, K-12, postsecondary, and workforce/labor)?
- Investigate whether data can already be linked across existing systems?

Data Governance — How will you ...

- Establish (or connect with existing) formal entities that have statewide authority to set data system rules, such as creating shared definitions or granting reasonable access for a particular use?
- Create (or connect with existing) informal structures with articulated decision-making authority that agency leaders can use to set priorities?

Data Quality — How will you ...

- Assess the quality of the data in the various existing state systems?
- Determine whether and how data quality is regularly monitored?
- Identify the processes in place to make corrections to data collections when errors are identified?

Robust Indicators — How will you ...

- Identify which measures are most appropriate for tracking progress on the career pathways initiative?
- Develop a plan to gather data to track those measures?

Capacity Development — How will you ...

- Ensure that there is sufficient data analytical capacity to support evaluation and continuous improvement?
- Develop new data capacities identified as necessary to the career pathways initiative?

Progress Review — How will you ...

- Assess what has worked well regarding data system development, what has not, and what open questions remain?
- Identify opportunities to proactively codify checkpoints to assess progress and make required adjustments to the data collection/use approach?

Endnotes

1 "Data Systems That Work," Data Quality Campaign, https://dataqualitycampaign.org/our-work/policy-areas/data-systems-that-work/.

2 "People Need Access to Data," Data Quality Campaign, https://dataqualitycampaign.org/our-work/people-need-access-to-data/.

3 "From Education to Workforce," Data Quality Campaign, https://dataqualitycampaign.org/our-work/policy-areas/from-education-to-workforce/.

4 Kate Kinder, Brooke DeRenzis, and Amy Ellen Duke-Benfield, "Building State Career Pathways Systems," National Skills Coalition, 2021, https://nationalskillscoalition.org/wp-content/uploads/2022/01/NSC-StateCareerPathwayToolkit_final.pdf.

5 "Career Pathways Systems," Perkins Collaborative Resource Network, https://cte.ed.gov/initiatives/career-pathways-systems#:~:text=Integrated%20career%20pathways%20have%20emerged,success%20for%20adult%20education%20students.

6 "Data Interoperability in Education: Empowering Those Closest to Students," Data Quality Campaign, 2020, https://dataqualitycampaign.org/resource/data-interoperability-in-education/.

7 "Roadmap for Cross-Agency Data Governance," Data Quality Campaign, 2018, https://dataqualitycampaign.org/resource/roadmap-cross-agency-data-governance/.

8 Alliance for Quality Career Pathways, "A Framework for Measuring Career Pathways Innovation: A Working Paper," Center for Postsecondary and Economic Success at The Center for Law and Social Policy, 2013, 8, www.clasp.org/sites/default/files/public/resources-and-publications/publication-1/CLASP-AQCP-Metrics-Feb-2013.pdf.

9 "The Next Step: Using Longitudinal Data Systems to Improve Student Success," Data Quality Campaign, 2013, 14-15, https://dataqualitycampaign.org/resource/next-step-using-longitudinal-data-systems-improve-student-success/; Pfeiffer, J., Klein, S., "Harnessing state longitudinal data systems to assess career and technical education outcomes," Pfeiffer Pfarm Consulting & Education Northwest, 2019, https://educationnorthwest.org/sites/default/files/resources/harnessing-slds.pdf.

10 S.B. 1, Ky. Gen. Ass. (2009), https://apps.legislature.ky.gov/record/09rs/sb1.html.

11 "KYSTATS History," Kentucky Center for Statistics, https://kystats.ky.gov/About/History#:~:text=KYSTATS%20was%20created%20in%202012,KDE)%2C%20the%20Council%20on%20Postsecondary.

12 "System Data," Pennsylvania's State System of Higher Education, https://www.passhe.edu/system-data/index.html.

13 "Workforce Outcomes," Pennsylvania's State System of Higher Education, https://viz.passhe.edu/t/Public/views/PASSHEWorkforceOutcomes/WorkforceOutcomes?%3AisGuestRedirectFromVizportal=y&%3Aembed=y.

14 "System Redesign," Pennsylvania's State System of Higher Education, https://www.passhe.edu/system-redesign/index.html.

15 Erik Gamm and Jason Gaulden, "Diagnosing Colorado's Skills and Attainment Gap," Common Sense Institute, February 13, 2024, https://www.commonsenseinstituteus.org/colorado/research/education/diagnosing-colorados-skills-and-attainment-gap.

16 "Colorado Talent Pipeline Report," Colorado Workforce Development Council, https://cwdc.colorado.gov/resources/colorado-talent-pipeline-report.

17 "Colorado's Longitudinal Data Landscape," Colorado Department of Higher Education, 2023, https://highered.colorado.gov/Publications/Reports/Legislative/1349/CDHE_Longitudinal_Data_Landscape.pdf.

18 H.B. 24-1364, Col. Gen. Ass. (2024), https://leg.colorado.gov/bills/hb24-1364.

19 "Secondary, Postsecondary and Work-Based Learning Integration (1215) Task Force," Colorado Department of Education, https://www.cde.state.co.us/postsecondary/secondary_postsecondary_and_work-based_learning_integration_task_force.

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About Bellwether

Bellwether is a national nonprofit that exists to transform education to ensure systemically marginalized young people achieve outcomes that lead to fulfilling lives and flourishing communities. Founded in 2010, we work hand in hand with education leaders and organizations to accelerate their impact, inform and influence policy and program design, and share what we learn along the way. For more, visit **bellwether.org**.

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ABOUT THE SERIES

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