
Purposeful Data Systems

A Strategic Approach for
Policymakers

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The Data Landscape

In today's economy, a postsecondary degree or similar credential of value is critical for economic and social mobility. During the Great Recession, those without a college degree fared much worse than bachelor's degree holders — a trend that continued during the recovery.ⁱ But raising postsecondary attainment levels is a challenge in every state, particularly as the costs of college continue to skyrocket. A comprehensive data system is a vital tool that states can use to help more of their residents achieve postsecondary success.

Good data allow policymakers to easily identify and address gaps in student access and outcomes, particularly for low-income students and students of color. In addition, because the price of a college degree is now so high, interest in return on investment (ROI) has become more important, both to consumers and to policymakers. Policymakers must ask some difficult questions: Are K-12 and higher education institutions providing a high-quality and equitable education to all students? Are students adequately prepared for college-level work? Once enrolled, do they progress in a timely fashion and graduate, and will their degree or credential hold value in our rapidly changing economy? Relevant, reliable, transparent and valid data are essential to help policymakers answer these questions, align statewide policies and investments to state goals and needs, and advance educational opportunities and outcomes for vulnerable student populations. State data systems that connect across all levels, sectors and systems of education, as well as into the workforce (i.e., a p-workforce framework), are the foundation upon which all other education policies and programs must be built to ensure a positive impact for all students.

Over the past few decades, states have invested time and resources to develop comprehensive longitudinal student data systems to help inform decision-making. According to the State Higher Education Executive Officers' (SHEEO) Strong Foundations, 2018 reportⁱⁱ, 32 states have postsecondary data systems that also connect to K-12 and to workforce/labor. But are policymakers actually using these data to drive policy decisions? Research conducted by HCM Strategists reveals that only 13 states also established feedback loops with the K-12 and workforce sectors to share data. This is just one example of the challenges states face when determining how to best use data to drive better policy and outcomes. This paper, therefore, aims to help policymakers identify the essential core components of an effective data system, as well as barriers to implementation, common pitfalls and potential solutions.

Core Components of Effective Data Systems

Effective data systems have five distinct components that work in harmony to impart value and support overall efficiency — **Governance; Access/Privacy; Infrastructure; Inventory; and Use.** A system's infrastructure, inventory and usage capabilities are at the core, while governance and privacy requirements provide oversight and ensure sustainability and strategic alignment.

If states are tempted to prioritize individual components of a data system and fail to take a holistic view, they risk limiting the optimal functioning of the system. Many states have successfully adopted one or two of the core components but struggle with the larger challenges inherent in the other areas. For example, most states have amassed an impressive collection of data inventory — the state-identified core data needed to support analysis relative to state priorities and outcomes. These include K-12 and postsecondary longitudinal data on enrollment, demographics, assessments, retention and completion. But states often struggle to make meaning of what they've collected and determine how to best use the multitude of data to drive decision-making. A key guideline here is that more data is not always better; a focused subset of metrics may prove to be more broadly applicable, and when used, more informative and transparent. Policymakers must take a strategic approach to the problems they're trying to solve and hone in on the metrics that will help inform those solutions.

As lack of data inventory is rarely a problem, states should begin to shift focus to the implementation of a strong governance system and well-designed infrastructure — the backbones needed to support the appropriate use of state data. These three areas generally offer the greatest implementation challenge to policymakers but are crucial to the successful performance of the whole.

Data System Exemplar: Kentucky

The Kentucky Center for Statistics (KYSTATS) houses and maintains the Kentucky Longitudinal Data System, which integrates education and workforce data.^{xxvi} KYSTATS — including its duties and functions — was established and formalized via legislative action in 2012^{xxvii} and is funded by state appropriations and federal grants.^{xxviii} It is currently governed by a board that is chaired by the secretary of the Kentucky Education and Workforce Development Cabinet; the board sets a biennial research agenda that helps guide the work of KYSTATS.^{xxix} In addition to having strong governance and infrastructure for its longitudinal data system, Kentucky has established policies and procedures for ensuring that data is secured and privacy is maintained.^{xxx} KYSTATS publishes these policies, along with their data and information-sharing agreement templates.^{xxxi} Kentucky's postsecondary data inventory includes gender; race and ethnicity; age; military status; degree-seeking status; full- vs part-time enrollment; overall enrollment status (i.e., first time, continuing or transfer); for-credit certificate; and persistence and retention.^{xxxii} The state reports its key metrics via publicly available reports and dashboards^{xxxiii} that are updated annually. Overall, Kentucky has established policies across multiple elements that make its longitudinal data system robust and effective.

Data System Governance, Infrastructure and Use

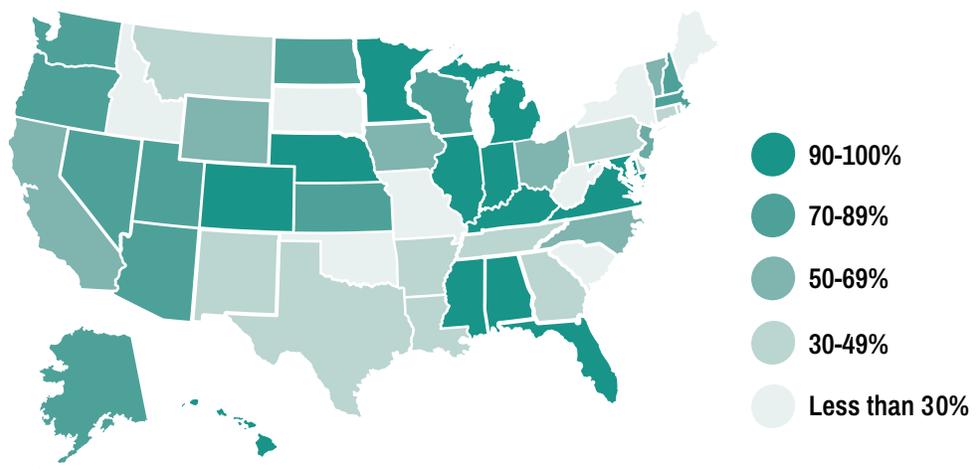
Data systems cannot operate effectively in the absence of thoughtful management. A proper governance structure ensures the strategic use and utility of existing data and establishes the long-term vision and goals for the data system. The governing entity articulates the priorities and issues the state is trying to address, as well as the data system capacities, infrastructure and inventory necessary to inform policy development. In addition, the governing system oversees key connections across sectors, and informs the use of data reporting in a way that allows for analysis of longer-term outcomes and trends; helps to maximize equity-focused decision-making within different agencies; and ensures that state goals and priorities are advanced.

The particular challenge here is shared ownership of and participation in the governance structure across agencies. This can be difficult to define and implement. Ample time and discussion should be given to how each agency is structured in order to find common ground with regard to priorities and the sharing of resources. This process to formalize the governance structure also plays a critical role in empowering agencies to take ownership of their data (i.e., collecting and updating it), thus increasing buy-in from all stakeholders.

A top consideration for all governing entities should be the proper handling of sensitive student data. Privacy concerns that limit the sharing of critical data can become a stumbling block for states if not managed strategically. Thorough access and privacy processes ensure transparency in the collection of data and protect student privacy when data are used. A recent spate of data privacy legislation in several states highlights a growing concern for the security of students' personal information.^{xiv}

Data System Governance Structure

Percent of Core Policy Components



Policymakers should implement robust protocols to help ensure the safety of any personally identifiable information. These include compliance with regulations (e.g., the Family Educational Rights and Privacy Act [FERPA], the Children’s Online Privacy Protection Rule [COPPA] and the Health Insurance Portability and Accountability Act [HIPAA]); policies regarding data access, storage and destruction; policies related to the prohibition of the sale and/or disclosure of data; and regular compliance audits.

As states and policymakers begin to think through data system governance, a first step is to take inventory of any existing governance structure to determine if it encompasses the following promising practices and then take action to address gaps:

- Establishing and formalizing a governing body (e.g., through legislation) to ensure sustainability;
- Identifying and engaging key stakeholders, such as core state agencies, leader representation from K-12 and postsecondary institutions, employers, legislators, and where aligned, parents and students;
- Defining roles and responsibilities across agencies and stakeholders;
- Developing a long-term vision and goals for the data system;
- Instituting oversight of the data system infrastructure, which includes management of an established data warehouse (integrated model) or established agreements across agencies/ sectors to allow data sharing (federated model) and tracking across sectors and into the workforce;
- Creating clear guidelines and protocols for data access and use; and
- Ensuring dedicated, adequate staffing levels to support the collection, validation and analysis of data.

Data System Governance in Maryland

The Maryland Longitudinal Data System (MLDS) Center is responsible for developing and maintaining the state’s education and workforce data system.ⁱⁱⁱ The MLDS is governed by a 12-member Governing Board that meets four times per year and is composed of key stakeholders, including the chancellor of the University System, the state superintendent of schools, and the secretaries of Higher Education and the Department of Labor, Licensing, and Regulation, among others.^{iv} The Governing Board’s bylaws outline its duties as well as the rules for governance.^v The primary purpose of the MLDS is to support policymakers in decision-making,^{vi} and the MLDS Center’s processes for obtaining and maintaining data are clearly outlined.^{vii}

The most recent meetings of the MLDS Governing Board took place in June and September 2019.^{viii} During the June meeting, the board discussed research and reporting priorities, the Fiscal Year 2020 budget, and legislative proposals for the 2020 legislative session, among other topics. In its September meeting, the Governing Board discussed a dual enrollment report, external research and grant-funded projects, data inventory, and a data inventory and collection calendar. Agendas, minutes, materials and audio recordings are available to the public for each meeting.

Once a solid governance structure is in place, states can begin to adequately address data system infrastructure. **The infrastructure is an established foundational framework to collect, store, share and protect data.** In addition to those core policy components, a data warehouse also should support significant coverage of

the student population and link to other state agencies (i.e., K-12, postsecondary, workforce/labor). As previously noted, a state's governance structure should be responsible for establishing and overseeing this foundational framework to mitigate current challenges. For example, a major barrier to access and effective use of data is the lack of connectedness among sectors. When agencies, institutions or sectors fail to communicate and share data through established feedback loops, it becomes impossible to identify gaps, measure outcomes and determine if a state's data inventory is aligned with state priorities and goals.

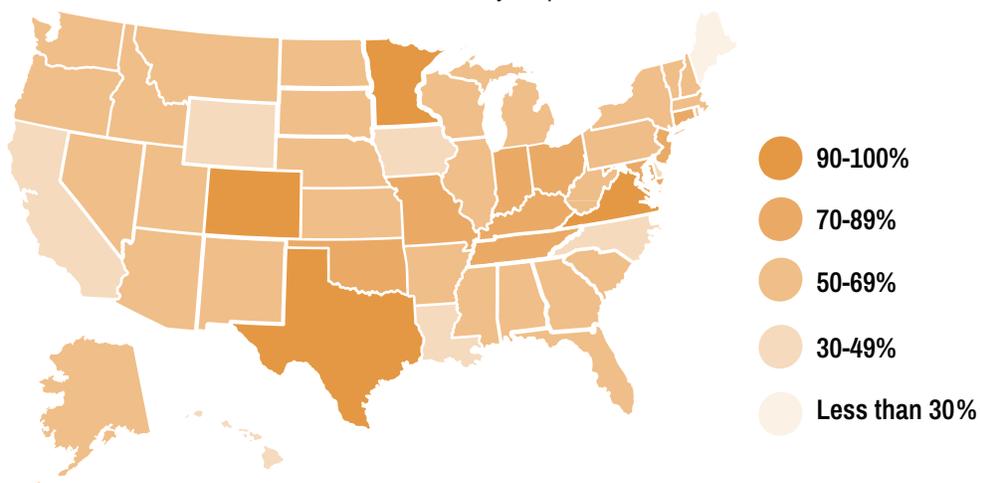
Lack of connectedness is indicative of weak governance. A strong governing structure can establish agreements between agencies/sectors to allow data sharing and tracking of students across sectors and into the workforce. Examples include state-level agreements with the National Student Clearinghouse and

Data Access and Privacy in Colorado

The Colorado Department of Education (CDE) publishes the federal and state laws it adheres to, as well as the policies and procedures it has established related to protecting student data.^{ix} The state also has specific policies in place for sharing data with other state agencies, school districts, and other parties,^x as well as for protocols to follow in case of data breaches.^{xi} The CDE requires its employees and contractors who have access to data to receive relevant training and regularly conducts compliance audits.^{xii} CDE also publishes information and resources for parents about how the state uses student data.^{xiii}

Data System Infrastructure

Percent of Core Policy Components



national/federal sources of labor market information, as well as linkages to cross-state data sharing, such as multi-state longitudinal data exchange, the Wage Record Interchange System (WRIS 2), and federal data sources. In addition, a well-planned and shared governance structure may have more collective power to encourage policymakers to direct adequate funding to support the establishment of the data warehouse and linkages, and ensure its sustainability over time.

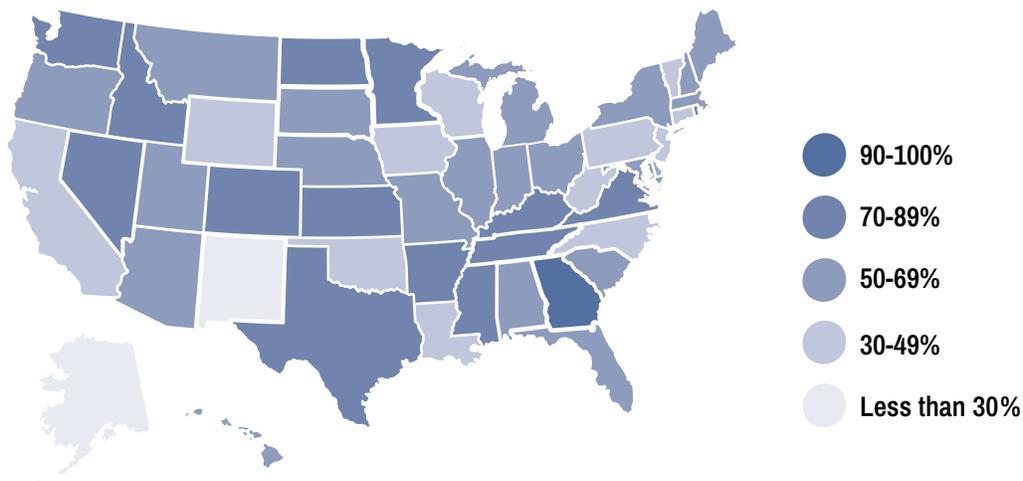
A frequent challenge states experience in this area is confusion between sectors caused by the absence of common terminology and data definitions. The governing entity can strengthen the infrastructure and streamline data use through standardization, establishing a data dictionary that ensures comparability across states, systems, and schools and institutions. States should also establish specifications for submitting, validating and changing data, and an audit system to ensure validity, reliability and data quality.

Equally important to overseeing the infrastructure is the **need for more focused and shared use of the data**. A strong governance structure can ensure consistent and broadly accepted conditions under which a state's stored data is displayed, accessed and used by stakeholders. In addition to those core policy components, the optimal approach has uniform student data metrics displayed on a user-friendly dashboard that is easily accessible by multiple stakeholders as a means to monitor state progress toward shared goals. A DataMart model can be used, which allows stakeholders to only pull information from relevant data segments housed in the warehouse. That data can then be analyzed and translated into usable information for a dedicated audience.

However, ways that states use, communicate and leverage data remain a hurdle. States collect a significant amount of data across the education pipeline (inventory) but have limited processes in place

Data System Use

Percent of Core Policy Components



to identify the critical elements needed to inform policy and practice. Data governance and infrastructure must be prioritized to ensure that data collection and analysis are used in ways that align with and support state education goals. Connecting cross-sector data systems and feedback loops enable states to understand student outcomes across the p-workforce continuum. States can then provide regularly updated, public dashboards (on an easily accessible and navigable website) that are simple to follow, answer the key policymaker questions, and offer instructions or storyboards on how to use and interpret the information.

Data Use in Minnesota and North Dakota

Minnesota has established key metrics for its Statewide Longitudinal Education Data System (SLEDS) to track progress toward state priorities and goals. Key metrics are reported annually in user-friendly public reports^{xv} and a user-friendly public dashboard.^{xvi} Minnesota has developed a SLEDS data dictionary^{xvii} and makes the data system available to multiple stakeholders.^{xviii} The state also provides feedback reports to high schools.^{xix}

North Dakota has established key metrics for its Statewide Longitudinal Data System (SLDS) to track progress toward state priorities and goals. The state makes its data system available to multiple stakeholders^{xx} and has established a data dictionary that is easily accessible online, with definitions for key metrics.^{xxi} North Dakota reports on key metrics annually in a user-friendly public dashboard.^{xxii} The state also provides feedback reports to high schools.^{xxiii}

A core responsibility of the governing entity is to establish metrics that reflect key concerns or priorities for state policymakers, disaggregated by priority populations, and then oversee the collection of data aligned to these metrics. To optimize use and transparency, the data should be displayed on a user-friendly, public dashboard that is updated at least annually. This allows multiple stakeholders to access the data for policy decisions, forecasting, early warning and targeted interventions.

Cost Implications for Data Systems

When a state first endeavors to establish a data system, it is usually in response to demand from elected officials and their staff, state agency leaders or stakeholders for better data to answer specific questions. However, the funding challenges of implementation are often underestimated; cost happens at every level of the data system life cycle.

A typical pitfall is misunderstanding how to structure funding to not only establish the system but sustain it over time. States will often allocate one-time funding to establish a data system but find that it proves inadequate for state agencies to keep up with system maintenance, technological upgrades and data updates. Very quickly, the information and system itself become outdated. States need to decide the best way to fund data system creation for longevity, whether through legislation, grant funding or other sources. For example, the Kentucky Center for Statistics receives funding through state appropriations in addition to federal grants, contributions from public agencies, and other grants to maintain the Kentucky

Longitudinal Data System (KLDS).^{xxxiv} In Fiscal Year 2019 and Fiscal Year 2020, the Education and Workforce unit (Office of Education and Workforce Statistics and the Board of the Kentucky Center for Statistics) received \$4.65 million and \$4.59 million, respectively, in state appropriations.^{xxxv}

The State Longitudinal Data System (SLDS) Grant Program was established in 2002 to help states develop data systems and increase sustainability.^{xxxiv} Through competitive grant funding and other resources, the program has helped states focus on specific areas they need to strengthen, such as K-12 or workforce data or creating linkages between sectors. After six rounds of funding, 47 states, three territories and the District of Columbia have benefited from SLDS grant funding.^{xxxv} In addition, in 2017, the SLDS Grant Program published the SLDS Grantee-to-Nongrantee Transition Self-Assessment Tool.^{xxxvi} The tool was designed to help states identify strategies to ensure the sustainability of their system, including personnel resources, financial supports, program priorities, governance and management.^{xxxvii}

System capacity is another important consideration for policymakers that requires planned, regular funding. Over time, capacity requirements change as the demand to produce more and different data types increases. Most state data systems simply do not have sufficient staff capacity to handle the many requests from various stakeholders as time goes on. Adequate capacity also requires that those on staff are equipped to use the data. The problem is twofold — staff need the time to do the deep thinking that is required of data-driven analysis, but they also need to possess the skill set that allows them to collect and validate data using good research principles, and properly analyze the data in ways that inform the needs of different audiences. Professional development and training for staff to improve capacity must be factored into the overall cost.

Some states have attempted to deal with capacity issues by outsourcing data collection on common dashboards and sharing the cost with third-party vendors. The problem this presents is a possibility that data privacy can become compromised. The public sector is rightly concerned about safeguards to personal student data, and states must weigh the risks and complications when introducing data access to new entities. The challenge for states is to develop data-sharing agreements that allow for a flow of information between sectors and agencies while still protecting sensitive student information.

A final important consideration for data system implementation is ensuring sustainability through shifting political administrations. Changing leadership generally brings new priorities and agendas; however, reliable data remains the best way to inform good policymaking. Again, if a state takes the time and effort to develop a strong governance structure up front, it is better prepared for sustainability across such instances. States must ensure that their data systems are protected through a strong governance process to withstand inevitable leadership changes.

Final Thoughts

This paper and the above best practices outline elements of an ideal data system. But states struggling with significant budgetary and other challenges should not allow the perfect to be the enemy of the good. In fact, trying to accomplish everything at once is most likely an effort doomed to failure. It is advisable for policymakers to start by prioritizing a strong governance structure, then finding one or two areas for the governing body to hone in on — for example, ensuring that state data are connected across all sectors and identifying key metrics in order to progress state efforts to the next level. Further improvements and refinements can then be built on these foundational steps.

It is critical to remember that there are no overnight successes or quick fixes. Data systems are never “finished” but are continually refined and updated to reflect new information, new technologies and new priorities. Taking the long view of data system development and use while working in incremental phases helps ensure that states can build needed capacity and stakeholder engagement that will sustain future system improvements.

Ultimately, policymakers need to articulate what they are trying to accomplish, identify which data they can use to help inform decisions, and report outcomes in an accessible and easy-to-understand format. As data-informed decision-making becomes standard, the efficiency of state data systems will only increase in value to policymakers. Efficient systems that provide the most useful data across multiple sectors hold the potential to help states meet attainment goals, narrow achievement gaps and solve difficult problems.

Endnotes

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