SLDS Topical Webinar Summary
Benefits and Use Cases for Employment Outcome Datamart

As states begin to look at student outcomes beyond their time in school, there is a growing priority to connect data across employment and education programs and to observe the long-term effects of education. How these data are brought together and managed can impact the flexibility, timeliness, and quality of the information provided. To ensure the quality of data and analysis, some states have established datamarts to give users easy access to targeted sets of data related to specific topics or questions.

Representatives from Kentucky, Minnesota, and North Dakota discuss the datamarts they have constructed to support connections between secondary education, postsecondary education, and workforce data, including population covered, data governance, and primary use cases.

Kentucky's Dynamic Dashboards

Kentucky established the Kentucky Center for Statistics (KYSTATS) in 2012 to maintain the Kentucky Longitudinal Data System (KLDS), which integrates data from the Kentucky Department of Education, the Council on Postsecondary Education, the Education Professional Standards Board, the Kentucky Higher Education Assistance Authority, and the Kentucky Education and Workforce Development Cabinet.

The KLDS includes data ranging from K12 and college outcomes data to labor market and health data. Some KYSTATS staff are authorized to link and de-identify information, then provide the de-identified data for researcher use. The data are secure and private, and Kentucky has restrictions on presenting data when cell counts are below a certain number.

Kentucky datamarts
KYSTATS takes a slightly different approach to datamarts than most traditional definitions. In Kentucky, users do not have direct access to a server or data warehouse. Instead, a mixture of static and dynamic reports and public-access files are made available to stakeholders. Data in public-access files are aggregated to different levels depending on the report or audience. For example, high school data are grouped by district, workforce data are grouped according to Kentucky's workforce areas, and postsecondary data are grouped by institution. The reports are interactive and allow stakeholders to dive into more detailed information based on filtering capabilities.

Kentucky use cases
KYSTATS has produced a number of dynamic reports that examine the transitions between education and workforce sectors. The *Skills U Feedback Report* examines the outcomes of General Education Diploma (GED) students, including wages earned before and after receiving the GED and whether students go on to postsecondary education and the amount of financial aid they receive. The *Kentucky Career and Technical Education Feedback Report* allows users to examine certificate pathways that students take. Stakeholders can look at specific areas where certificates are earned and determine whether these certificates and skills are aligned to projected jobs in the area. In figure 1 on page 2, the *Postsecondary Feedback Report* examines longitudinal employment outcomes for postsecondary graduates. Users can examine outcomes for specific majors 3, 5, and 10 years after graduation. The datamart that provides this information includes the data at an aggregate level. Users can examine graduates by majors at specific institutions, the

number of graduates working in specific fields, and the regions in which they are employed. This information is then used to determine whether institutions are over- or underproducing graduates for specific employment fields.
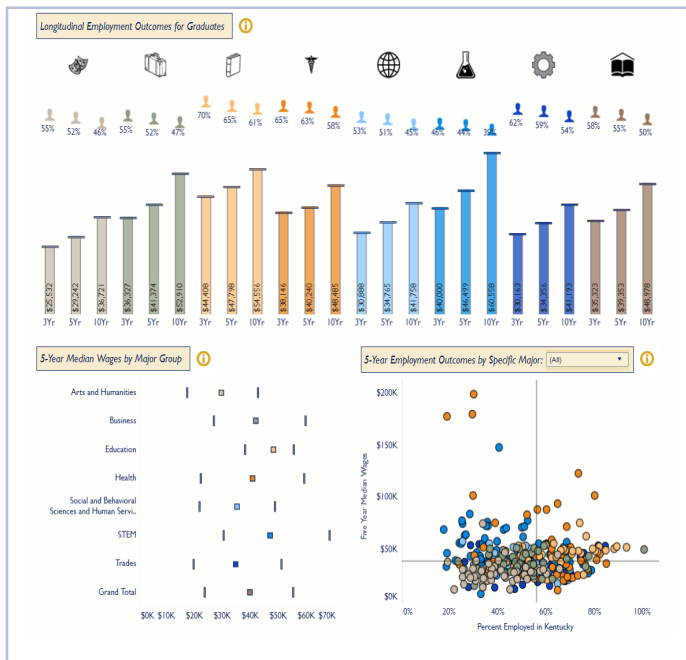

Figure 1. The *Postsecondary Feedback Report* allows Kentucky colleges and universities to determine whether their graduates are meeting the state's workforce demands.

Minnesota's Outcomes Dashboards

Minnesota's Statewide Longitudinal Education Data System (SLEDS) brings together education and workforce data from the Minnesota Department of Education, the Minnesota Department of Employment and Economic Development, and the Office of Higher Education to

- identify the most viable pathways for individuals in achieving successful outcomes in education and work;
- inform decisions to support and improve education and workforce policy and practice; and
- assist in creating a more seamless education and workforce system for all Minnesotans.

In 2014, SLEDS launched a mobile analytics website with aggregate reports on high school graduates and postsecondary outcomes. Users can examine data by school district, college and university, and economic development region. Resources such video tutorials, user support libraries, and access to the SLEDS Network are also available. Minnesota produced the Graduate Employment Outcomes tool (*mn.gov/deed/geo*), which shows postsecondary outcomes by graduation year, location and award type, instructional program, and school. Tools like these are available due to federal mandates such as the

Workforce Innovation and Opportunity Act and other legislation that require public reporting of outcomes data.

Minnesota datamarts
SLEDS's datamarts offer access to de-identified student-level employment and wage outcomes data to local data providers. The SLEDS website provides a link to the secure datamart page where users can learn more about the data elements available as well as the data sharing agreement required to receive access. The K12 datamart, launched in 2015, provides information such as employment, wages, hours worked, and industry for high school graduates who do not go on to enroll in postsecondary institutions. The postsecondary datamart launched in 2016 provides data on graduates' employment, wages, hours worked, and whether they are employed privately or by the government. All datamarts are password protected.

Due to increasing use of the datamarts and the need for more user resources, SLEDS launched the SLEDS Network in 2017. SLEDS Network participants who are already familiar with the data system work individually with colleges, school districts, and universities to leverage their datamarts for the best reporting capabilities possible.

KYSTATS is also pursuing relationships with agencies such as the Department of Workforce Investment to collect apprenticeship data and the Department of Transportation to collect driver licensing data.

Minnesota use cases
Minnesota recently used its datamarts to develop institution-level outcomes dashboards. Institutions upload their own data using their SLEDS secure reports, and the dashboards populate visualizations with the institution's data. Dashboards include wage data by academic award level and program. There is also a crosswalk from Classification of Instructional Programs (CIP) codes to Minnesota university course numbers and names, so users can view program names as well as the course codes. Institutions can also compare their graduate data alongside state wage data or specific programs at other Minnesota institutions (see figure 2 on page 3).

North Dakota's Public Research Requests

Many of the employment outcome research questions that North Dakota's SLDS program receives pertain to transitions between education and work. Policymakers are interested in whether the state is retaining its postsecondary graduates as they enter the workforce, as well as the wages they are earning. Geographic retention of students is also a concern: graduates of vital programs such as health care might not move to rural areas in North Dakota, leaving these areas in need of adequate care.
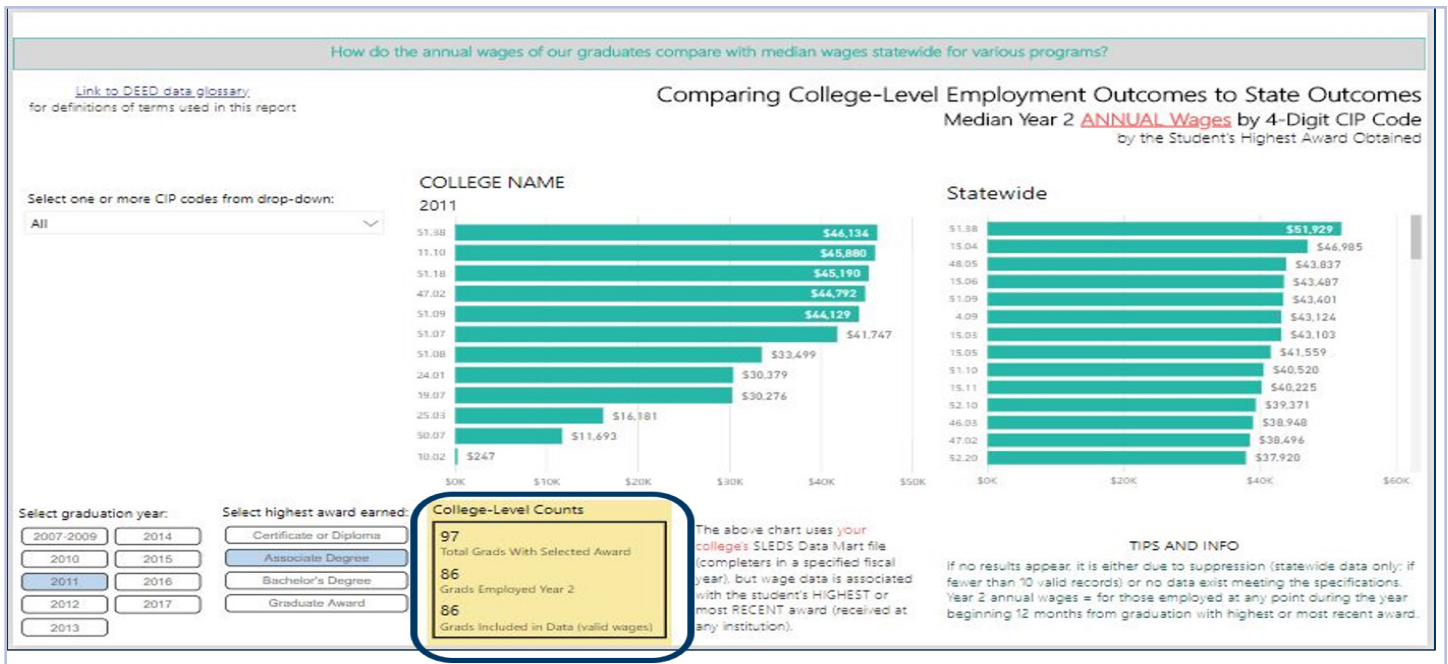
Figure 2. Minnesota's Employment Outcomes Dashboard allows users to compare their postsecondary institution's data to statewide data. Because some programs have low numbers of graduates, institution users need to pay attention to how their graduate counts change as they filter their data down to specific programs. To help with this, the dashboard includes a highlighted box displaying the graduate counts.

These questions have given rise to even more, leading the North Dakota statewide longitudinal data system (SLDS) to create a more formal governance process for data requests. Researchers must complete a research request form via the SLDS's website. The request must include a summary of the proposed research, how the research will be used, how the project aligns with North Dakota state priorities, and additional details. A group of researchers from the SLDS's contributing agencies reviews the requests every 2 weeks.

North Dakota's SLDS environment contains data for each of its major contributors: K12 schools; Job Service North Dakota, which provides unemployment insurance wage data; and the North Dakota University System. Each dataset is housed in its own data warehouse for the contributing agency's use. As users need data from multiple warehouses, North Dakota creates a specific database to house those data. For example, if postsecondary enrollment data need to be linked to K12 data, North Dakota creates a database that moves the postsecondary data into the K12 warehouse.

North Dakota's SLDS uses a variety of tools, including

- Microsoft SQL Server;
- DevExpress;
- Microsoft Power BI;
- Microsoft Cube;
- Shiny; and
- IBM Cognos Analytics

Datamarts and shared resources
Databases in North Dakota are created as needed, and access is securely provided to individual researchers. The data in these databases are secured at three different levels:

- Private, personally identifiable information (PII) is available
- Information is de-identified
- Information is de-identified, and there is low-cell suppression.

PII is available in the K12 and Accountability datasets. Public reporting sites, however, are de-identified and have low-cell suppression. Any dataset has the potential to become a research datamart based on researcher need and authorized security level. Datamarts may be populated on a nightly basis or historically preserved for prior years.

North Dakota structures access to its databases according to six different levels:
- **Level 1.** Individuals at this level are authorized SLDS staff members who have complete access to the data. Data matching and merging is completed at this level.
- **Level 1B.** This level of access is granted to an authorized information technology staff person for each contributing agency. Level 1B staff members have access only to their own agencies' data.
- **Level 2.** Individuals with this level of access are authorized researchers jointly conducting data

preparation across data domains. This includes authorized state agency staff members and researchers. These individuals have access to PII from warehouses other than their own agency's in the form of datamarts.

- **Level 3.** Individuals with this level of access handle requests involving identifiable, student-level data. If researchers at this level are working with an institutional review board (IRB), evidence of IRB approval for the study is required. SLDS Research Workgroup approval is required, as well as a data sharing agreement.
- **Level 4.** This level allows access to de-identified, student-level data. If researchers at this level are working with an IRB, evidence of either IRB approval or waiver may be required, in addition to SLDS Research Workgroup approval.
- **Level 5.** This level covers public access to the SLDS. It allows viewing of aggregate reports and data. Research requests for public data may be made, and they require SLDS Research Workgroup approval.

Figure 3. North Dakota's public datasets will allow stakeholders to delve further in data and ask more detailed research questions.

North Dakota use cases

North Dakota's Insights database provides publicly available datasets to all researchers. Figure 3 shows the job service datamart within the North Dakota University System. This datamart compiles data from multiple warehouses so that researchers can examine outcomes data for North Dakota's high school and postsecondary graduates. Data in this datamart are prepared for researchers by flattening or combining multiple tables to single tables for easier use in building visuals.

The North Dakota Information Technology Department uses datamart information to answer a variety of questions, such as whether nursing program graduates remain in North Dakota for work and whether the supply of future nursing graduates will meet future demands.

In the future, North Dakota will unveil publicly available datasets containing basic education and employment outcome information, such as postsecondary graduates and future workforce supply. Once this information is readily available to the public, the SLDS team hopes to receive research requests that drill even farther into the data.

Conclusion

Datamarts can be a valuable tool in connecting education and employment data. By creating these condensed and more focused data warehouses, states can improve flexibility, timeliness, and quality of the data provided to both policymakers and the public.
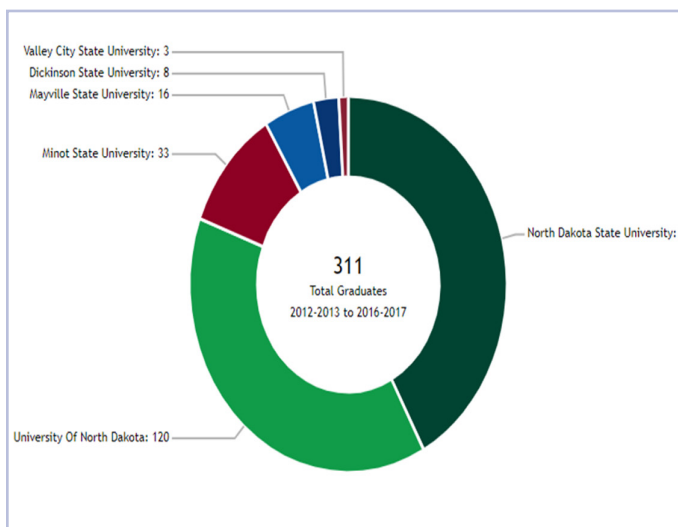
Additional Resources

Achieving Comparable Employment Outcome Metrics: SLDS Webinar
https://slds.grads360.org/#communities/pdc/documents/17712

Addressing Employment Outcome and Workforce Questions: SLDS Issue Brief
https://slds.grads360.org/#communities/pdc/documents/17952

Best Practices for Calculating Employment and Earnings Metrics: SLDS Issue Brief
https://slds.grads360.org/#communities/pdc/documents/13014

Employment Outcome Indicators: SLDS Webinar
https://slds.grads360.org/#communities/pdc/documents/9944

Employment Outcome Measures: SLDS Webinar
https://slds.grads360.org/#communities/pdc/documents/14306

Expanding the Use of College and Career Data: SLDS Webinar
https://slds.grads360.org/#communities/pdc/documents/15112

Kentucky Center for Statistics
https://kystats.ky.gov

Linking K12 Education Data to Workforce: SLDS Webinar
https://slds.grads360.org/#communities/pdc/documents/5871

Minnesota Graduate Employment Outcomes Tool
https://mn.gov/deed/geo

Minnesota Statewide Longitudinal Education Data System
http://sleds.mn.gov/

North Dakota Insights
https://insights.nd.gov/

Sources and Linking Strategies for Employment Data: SLDS Issue Brief:
https://slds.grads360.org/#communities/pdc/documents/11943