States increasingly want to know how well education prepares students for the workplace. The first step toward seeking answers to that question is to correctly and appropriately associate education and employment data.

Once those data are linked, a state must determine and define measures that are adequate and consistent and that accurately depict the employment outcomes of students. Further, the state must establish the potential impact education played in those outcomes.

In this webinar, representatives from Connecticut and North Dakota discuss why a state might want to link education and employment data, potential sources of employment data, how to associate education and employment data, and examples of employment outcome measures used in those states.

Why Link Education and Employment Data?

A state could choose to link education and employment data for a number of reasons, including to improve education programs, develop policy, support grants, or raise public awareness of education and employment issues.

Improving education programs
To examine the effects of education programs, a state could determine whether graduates of those programs are employed and what wages they earn. States might use such information to improve education programs with the goal of bettering student outcomes such as job placement, education-to-employment pathway alignment, and job opportunities.

Developing policy
Linking education and employment data also can help policymakers understand equity. For example, policymakers could ask whether programs are leading to similar outcomes for students of all backgrounds. By examining outcomes, policy changes can be made to address disparities. Other topics that might interest policymakers include examining outcomes in different regions of the state or whether students entering the workforce are staying in the state.

Grant support
Grant proposals and evaluations often require applicants to establish a sense of need, which can be supported by data. Later, grant recipients often are asked to evaluate whether the funded programs or initiatives were effective.

Public awareness
Data can help current and future students understand what outcomes are associated with degrees and consider whether their degrees of choice will provide them with the outcomes they desire.

Other uses
Linking education and employment data also can be useful for situations such as

- accreditation for various programs and institutions;
- Workforce Innovation and Opportunity Act accountability, which requires wage outcome data;
ensuring compliance with gainful employment law;
performance budgeting;
fiscal evaluation; and
workforce development programs.

**North Dakota**

North Dakota’s primary drivers for using education and workforce data are to answer policy questions around the outcomes of state investments in education. Workforce development and workforce accountability programs are required to measure the outcomes of participants in the state. Additionally, teaching colleges, for their accreditation, are keeping track of their students after graduation as they become classroom teachers.

North Dakota also is experiencing a workforce shortage at the regional level. Economic developers are working with economic agencies to look at resources available regionally. They want to learn whether graduates within a region are staying in the region, moving elsewhere in North Dakota, or moving out of the state. The state is investing in high-demand occupations that require associate’s degrees and four-year degrees and is finding that the number of graduates remaining in the state diminishes over time. Because of that, North Dakota is considering tracking graduates who leave the state.

**Finding Sources of Employment Data**

**Connecticut**
The Connecticut Department of Labor’s unemployment insurance (UI) program provides most of the employment and wage data for Connecticut. The state recently modified its data sharing agreement to take advantage of the Wage Record Interchange System (WRIS) 2, which provides access to employment data from other states. Unfortunately, two of the most common destinations for Connecticut graduates who leave the state—New York and Massachusetts—are not included in WRIS 2.

Connecticut links data through the Preschool through 20 and Workforce Information Network (P20 WIN), established with a 2009 Statewide Longitudinal Data System (SLDS) grant that allowed the state to increase interoperability among data systems. The funding was limited and states showed little interest in developing a centralized warehouse, but the grant did enable and support interagency data linking for education and workforce agencies.

The state’s federated SLDS model is a voluntary collaboration among participating agencies. Although it does not receive designated funding from the state, it has been operating for three years.

**North Dakota**

Like Connecticut, North Dakota’s primary source of workforce outcomes information is UI wage data. However, 25 to 30 percent of UI records identify individuals only by Social Security number and do not include names. One way the state has addressed the problem of matching these records to education data is to use driver’s license data to fill gaps in identifying data, especially with K12 records that typically do not contain Social Security numbers. The driver’s license data has increased the match rate to 90 percent for

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Figure 1. Connecticut’s P20 WIN uses a federated SLDS model in which various education and workforce agencies voluntarily collaborate on the system.
K12 students who do not enter college, where Social Security numbers are available for record matching. North Dakota also has used WRIS 2, the Federal Employment Data Exchange System, and labor market information from Job Service North Dakota to fill in some gaps in data. Additionally, the state plans to participate in the Multistate Longitudinal Data Exchange (MLDE) to obtain more information about graduates who move out of the state.

MLDE, WRIS 2, and UI wage data all have limitations. In North Dakota, UI wage data are provided in an aggregated format, which is burdensome for accountability reporting and must be augmented with other data. Those requesting UI data do their matching work in advance, and then send those results to the North Dakota Information Technology Department (ITD). ITD then will join the report to UI wage data to produce a new aggregate report. Other frustrations include a low rate of record matches between education and workforce data and the fact that wage data are not available until one quarter after they are collected.

WRIS 2 data often are restricted to programs that require outcome measures for federal or state accountability. Raw data are purged after the current study or reporting needs are met; historical data can be preserved only in aggregate. Additionally, not all states and territories participate in WRIS 2. Data are available two quarters after they are collected and only from the previous eight quarters, making long-term studies and time-sensitive reports difficult.

Timeliness is an issue with MLDE data. Each study performed through MLDE must be approved by each participating state, and approval of requests often happens quarterly. Additionally, data preservation is allowed only for the period of the study, so the data must be destroyed after that time.

**Linking Methods**

**Connecticut**

Under Connecticut’s federated data system, data from different agencies are linked only for use in an approved audit or evaluation. The Connecticut Department of Labor is the designated data-matching agency. Two methods of linking are used: deterministic and probabilistic.

For deterministic matching, Connecticut links postsecondary data to wage data using Social Security numbers. If a record does not contain a Social Security number, it is not included in the dataset.

For probabilistic matching, Connecticut links high school data to wage data using records from the Connecticut Department of Motor Vehicles. High school records from the Connecticut State Department of Education identify individuals using first and last name, date of birth, town of residence, and gender. Wage records from the Connecticut Department of Labor contain an individual’s first initial, last name, and Social Security number. Department of Motor Vehicles records can provide a bridge between education and wage records because they contain first and last name, Social Security number, date of birth, town of residence, and gender.

**North Dakota**

North Dakota uses a deterministic matching process to link education and workforce data. The state’s primary linking strategy is to establish a cross-reference between individuals’ secondary and higher education records as early as possible. When students reach ninth grade, North Dakota begins exchanging student IDs between K12 schools and the university system to make future data linking between those sectors easier. When necessary, the state uses driver’s license data to help match education and workforce records.

North Dakota also can use teacher licensure data systems to link postsecondary data from educator preparation programs with employment data for teachers once they enter the classroom.

The state has started using an early education registration system that allows some participating systems to get state student IDs for students in early education programs.

**Employment Outcome Measures**

**Connecticut**

In Connecticut, the creation of employment and wage outcome measures has evolved since the state began providing employment data to colleges and universities more than 10 years ago. For many years, the Connecticut Department of Labor has produced an annual higher education report that is required by the state legislature. The report offers valuable information, but it is static. More recently, the state has worked to produce longitudinal data from five different cohorts of graduates showing outcomes from all community colleges and state universities. It offers data at four points in time, both before and after graduation.

The state also produced a summary report along with data tables. The report is designed to be user friendly and offers visuals that contain key findings about graduates in Connecticut.

Connecticut is actively working on a data sharing agreement to provide updated reports that would display common data by sector, including community colleges, state universities, independent nonprofit institutions, and the state’s flagship university. The state also plans to allow additional agencies and people to conduct analysis with unit-record-level data; include out-of-state wage data from WRIS 2; and add factors such as age, scholarships, town, and zip code.

Rather than reporting quarterly wages, the state is developing a definition and calculations for estimated
annualized wages. It also will use the U.S. Census Bureau’s definition for stable employment, which is based on the number of individuals who were employed during the quarter being examined, the quarter before, and the quarter after. Plans also are in place to better identify and measure outcomes for individuals who are employed and in school at the same time. Further, the state plans to improve its data visualizations to be more useful and accessible.

**North Dakota**

North Dakota’s current project is a study of North Dakota University System graduates in the fields of nursing, energy, health care, information technology, and manufacturing. The Graduate Employment Study asks the following questions:

- How many students are graduating with degrees in these areas over time?
- How many graduates are staying within North Dakota for employment?
- How many years after graduation are individuals staying in the state?
- Where are graduates going within the state for employment?
Additional Resources

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

CEDS Connections: Employment Outcome Indicators
https://slds.grads360.org/#communities/pdc/documents/13035

College & Career: 2017 SLDS Best Practices Conference
https://slds.grads360.org/#communities/pdc/documents/13878

Common Education Data Standards (CEDS)
https://ceds.ed.gov/

Connecticut Higher Education 2015 Legislative Report Card

Connecticut P20 WIN: How Data Are Linked
https://www.youtube.com/embed/bwJY8qEHYW0

Connecticut State Colleges & Universities
http://www.ct.edu/