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All Data Big and Small

Using Information to Guide Workforce Development

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Stakes are high for the workforce development field, as globalization and automation threaten conventional wisdom about what it takes to get a good job. Workers with only a high school diploma have shrinking options for employment, especially in jobs that provide a living wage and benefits. At the same time, education costs are rising, and a college degree is not an automatic ticket to the middle class. Amid this uncertainty, students and job seekers are searching for paths that lead to economic stability. Policy leaders and program managers want to help by investing in workforce development, but tight budgets are creating tremendous pressure to demonstrate that public resources are funding strategies that get results. Now more than ever, data are critical to helping policy leaders, students, job seekers, and program managers make informed choices about workforce development.

Government leaders recognize the need for better information, so they are making significant investments in data analysis to inform decision making. Colorado Governor John Hickenlooper is an advocate for data-driven policy, telling a crowd in 2016 that “in every single agency, if you use data, you’re going to get results. . . . American democracy is the greatest form of government on earth, but it is also the most fragile. It’s dependent on people believing in their government. If we’re not able to begin to use facts more successfully, and make sure people in the entire community are aware of that, then we’re putting our very form of government at risk” (Hickenlooper 2016).

In this spirit, the U.S. Departments of Education and Labor have invested about \$750 million since 2005 in state longitudinal data systems, which link individual-level data across time and across programs (Clark et al. 2014). In addition, more than a dozen states dedicate part

of their annual budgets to their longitudinal data systems (Workforce Data Quality Campaign 2016). These systems allow analysts to match data, including wage records reported quarterly by employers for the Unemployment Insurance (UI) program, to reveal how different cohorts advance through education, workforce programs, and the labor market. Multiple technological and procedural safeguards keep confidential data private and secure, while enabling the use of aggregate or non-identified individual data. Federal and state governments also invest in surveys directed by the U.S. Census Bureau, Bureau of Labor Statistics, and other public agencies to generate labor market information, and local workforce leaders purchase online job ads analysis from private vendors. Several companies now offer analytics packages that scrape information from online job ads to help community colleges, workforce development boards, and state agencies identify types of training that might lead to good jobs in their communities. There are limitations to online job ads data, including a bias toward high-skilled occupations (Carnevale, Jayasundera, and Repnikov 2014), but many workforce development experts are investing in it to supplement traditional survey-based information.

Are these investments in data analysis paying off in ways that help students, workers, and businesses thrive in our nation's changing economy? While the workforce development field is not yet using data to their full potential, there are compelling examples of data making a difference in building America's skilled workforce. The remainder of this chapter, summarized in Table 17.1, describes how data are helping to improve human capital development policy and practice. It describes how data are being effectively used by three different groups: 1) policymakers, 2) students and job seekers, and 3) program managers.

POLICYMAKERS: TARGETING RESOURCES

Officials at all levels of government rely on data to help them decide how to invest limited resources and provide assurance that those investments are getting results. Over the past two years, the nonprofit organization National Skills Coalition worked with four states—California, Mississippi, Ohio, and Rhode Island—to develop specific data tools

Table 17.1 Data Use in Workforce Development

Data user	Objective	Examples
Policymakers	Target public resources to effective workforce development strategies	<ul style="list-style-type: none"> • Rhode Island is using labor supply/demand analysis to identify high-demand occupations, such as jobs related to finance and computers, and award bonus funding to colleges preparing students for these occupations. • Mississippi’s state plan for workforce development calls for using career pathway data analysis to direct job seekers to training with a track record of success.
Students and job seekers	Choose education and training programs that help achieve their goals	<ul style="list-style-type: none"> • Data about postcollege earnings, like the information published in the Department of Education’s College Scorecard, can influence student choices about school and major. • Washington State’s Career Bridge website, which displays employment outcomes for education and training programs, is viewed yearly by more than 190,000 students, unemployed job seekers, and workers looking to change careers.
Program managers	Improve services and address equity gaps	<ul style="list-style-type: none"> • Data revealed that adult students at Oakton Community College had lower persistence and completion rates than their younger peers, prompting the school to create new opportunities for work-based learning to help them succeed. • New York City’s workforce board uses customized performance metrics for priorities like employer collaboration, leading to shorter bouts of unemployment and increased earnings for program participants. • Academy of Hope Charter School in Washington, DC, regularly monitors data dashboards to accelerate progress for students close to getting a GED.

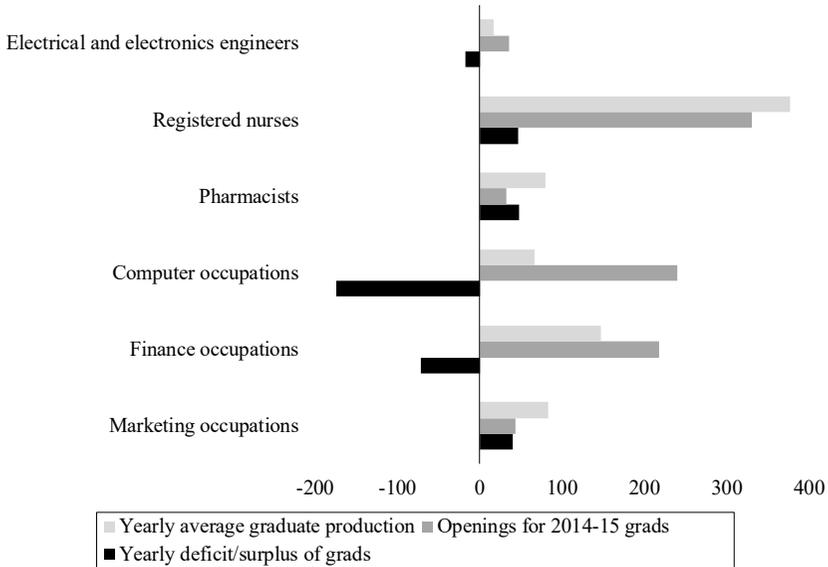
to help policymakers make better decisions about workforce development. The State Workforce and Education Alignment Project (SWEAP) awarded small grants to the states for tool development, and provided technical assistance from National Skills Coalition staff and consultants. All four states engaged policymakers in designing their tools. The following section highlights how Rhode Island and Mississippi have already integrated their tools into statewide visions for workforce development.

Labor Supply/Demand Analysis in Rhode Island

In Rhode Island, SWEAP work fit neatly into the vision of newly elected Governor Gina Raimondo. She prioritized the creation of a data-driven, business-led workforce development system, exemplified in her Real Jobs Rhode Island initiative to align workforce and education programs with employer skill needs. To identify those occupations most likely to face shortages of skilled workers, Rhode Island officials developed reports (see Figure 17.1) that compare the number of recent post-secondary graduates in specific programs of study with occupational projections from the state's labor market information division (National Skills Coalition 2017a). The labor market information division worked with the office of the postsecondary commissioner to create a crosswalk between programs of study and relevant occupations, so state reports could show the supply of recent graduates versus the predicted job openings by occupation (National Skills Coalition 2017b).

This supply/demand tool is already helping Rhode Island's higher education system select which programs will be used to measure institutional performance under a new funding formula. The formula, mandated by state law in August 2016, awards additional funding to institutions that meet targets for numbers of graduates in high-demand, high-wage fields (National Skills Coalition 2017a). The data are also producing some key takeaways for workforce development leaders, including the need for more workers trained in computer-related occupations, and evidence for the labor market value of associate's degrees and certificates in middle-skill occupations (DataSpark 2016).

In addition to using tools developed through SWEAP, policymakers in Rhode Island are applying data in new ways to determine program eligibility for dislocated workers. States receive federal funding through

Figure 17.1 Rhode Island Labor Supply/Demand Report

SOURCE: DataSpark (2016).

the Workforce Innovation and Opportunity Act (WIOA) to provide services to workers who lose their jobs due to economic shifts, such as plant closures or declines in particular occupations or industries. Rhode Island faced challenges in verifying eligibility for dislocated worker status, largely due to participants having difficulty providing complete and detailed information about their work histories. The state passed a new policy on eligibility determinations in December 2016, so the state's workforce agency now uses UI wage data and labor market statistics to compare laid-off workers' recent salaries with the projected earnings from their occupation. Individuals with earnings below the projected amount are designated as "dislocated workers" and may be served with federal funds. State officials estimate that the new methodology will make about twice as many dislocated workers eligible for services (Leventoff 2017a).

Pathway Evaluators in Mississippi

Mississippi has a strong state longitudinal data system called LifeTracks based at Mississippi State University. LifeTracks links data across multiple sectors, including PK–12 education, WIOA programs, career and technical education, and public colleges and universities. “Data has become a valuable asset for promoting economic development and for developing policy that matters to our citizens,” said Mississippi Governor Phil Bryant. “Data has real value when converted into actionable intelligence” (National Skills Coalition 2017c). With its advanced data infrastructure, Mississippi is building two SWEAP tools that can analyze career pathways to customize services for different populations.

With Mississippi’s new Career Pathway Analyzer tool, a user can define the starting characteristics for a cohort such as demographics and prior education, as well as exit conditions such as target occupation and earnings. For example, a user could query which pathways to advanced manufacturing employment result in the highest earnings, and the tool would show multiple pathways in descending order of earnings. In another example, the tool can show the portion of a cohort that followed a specified pathway (e.g., associate’s degree) and their credential attainment. A similar tool, the Career Pathway Constructor, will enable users to design a custom pathway for a particular population and discover the actual outcomes for program participants with the selected characteristics who previously followed that pathway. For example, the head of a veterans’ employment program could use the tool to decide whether to help clients enter health professions by investing in apprenticeships or in certificate programs (National Skills Coalition 2017a).

Mississippi embedded the concept of customized career pathways into its WIOA Combined Plan, which sets goals for collaboration between One-Stop Centers, adult education programs, Temporary Assistance for Needy Families (TANF) services, and other workforce development programs. The plan calls for all partnering programs to collect the same basic information on new clients, and to create an Individualized Success Plan that identifies cross-program services and referrals needed to help the client move toward unsubsidized employment. The Success Plans are updated as participants receive services, such as basic education or technical training, and become ready for work (State

of Mississippi 2016). Program managers may use the SWEAP tools to help design Success Plans based on which services have a track record of success for clients with particular barriers to employment. State officials note in a report that “the SWEAP tools will provide strong support for Mississippi’s new streamlined workforce model” (National Skills Coalition 2017c).

The state also anticipates using the Career Pathway Analyzer and Constructor in emerging policy areas, including identifying credentials of value and performance-based budgeting. An increasing number of states are setting up processes to use outcome data, business input, labor market information, and other factors to create lists of credentials that have value in the workforce. These lists help states decide which credentials count in their postsecondary attainment goals, and implement accountability requirements for WIOA and other programs (Leventoff 2017b). Mississippi’s state workforce board is considering ways of vetting credentials and expects that the SWEAP tools will be helpful in this process. At the same time, state legislators are taking an interest in performance-based budgeting, which directs resources to those programs that demonstrate positive results. SWEAP tools “could be leveraged by the legislature to evaluate the performance of various training programs, and these evaluations could help the legislators ensure that effective programs continue to receive adequate funding” (National Skills Coalition 2017c).

STUDENTS AND JOB SEEKERS: PICKING THEIR PATHS

Postsecondary education is more important than ever. Through 2024, an estimated 80 percent of all U.S. job openings will require some kind of postsecondary education (National Skills Coalition 2017d). But for students and job seekers, the proliferation of programs and credentials, combined with a swiftly evolving economy, makes it challenging to choose an education and career path. Federal and state leaders, as well as foundations and private sector companies, are investing in efforts to make data more accessible to these audiences. Scorecards showing postsecondary program outcomes and career information are becoming more widely available, and there is some early evidence that these

tools influence decisions, particularly by making students more aware of potential labor market outcomes.

College Scorecard

In 2015, the U.S. Department of Education launched a redesigned College Scorecard website. The College Scorecard displays key metrics for every institution in the country that is eligible for federal Title IV aid, commonly known as Pell Grants and student loans. The College Scorecard includes more than 7,500 schools (Hurwitz and Smith 2016). Table 17.2 shows the breakdown of institutions included in the College Scorecard, by both portion of students and portion of schools (U.S. Department of Education 2017). For each institution, the College Scorecard contains metrics on costs, average debt amounts and repayment rates, and graduation rates, as well as two measures of earnings for each postsecondary institution: 1) the percentage of former students earning above \$25,000 annually, which is the average salary of a high school graduate six years after enrollment; and 2) the median earnings of former students who were employed 10 years after enrollment. The earnings measures are calculated by linking student data from the U.S. Department of Education with tax data managed by the Social Security Administration. And because earnings outcomes vary significantly within institutions based on program of study, the College Scorecard could be improved by showing metrics by program, not just institution (Zinn 2016).

A few research studies examine how the College Scorecard, and postcollege earnings information more generally, influence student decisions about colleges and majors. One report analyzes data about where students send their SAT scores, often considered a proxy for college applications, and compares college selection before and after the College Scorecard release. The researchers do not have information on whether students in their data set actually used the College Scorecard, but they do try to isolate the effects of the College Scorecard release using statistical methodology. The study concludes that earnings information is the only part of the College Scorecard that influences student behavior, and estimates that “each 10 percent increase in reported earnings results in a 2.4 percent increase in score sends. The impact is driven almost entirely by well-resourced high schools and students” (Hurwitz and Smith 2016). Another report surveys California community col-

Table 17.2 College Scorecard Distribution of Students and Schools

	% of students	% of schools
Public < 2 year	8.2	8.9
	0.2	
Private nonprofit < 2 year	0.2	2.9
	3.6	
Private for-profit < 2 year	3.6	35.7
Public 2 year	30.2	11.3
Private nonprofit 2 year	0.8	2.3
Private for-profit 2 year	2.3	8.5
Public 4 year	34.9	8.3
Private nonprofit 4 year	15.3	17.9
Private for-profit 4 year	4.4	4.3

SOURCE: U.S. Department of Education (2017).

lege students about choosing a major and provides them with randomly assigned versions of information about salaries and the probability of employment in particular industries. This research suggests that labor market outcomes have a significant effect on a student's choice of major, and the impact grows when students are confident about the information's accuracy (Baker et al. 2017). Other studies are consistent with these findings and note that different metrics for employment outcomes can significantly change student decisions on their programs of study (Ruder and Van Noy 2014). Taken together, the literature suggests that using the College Scorecard can make real impacts on student choices. For disadvantaged students with fewer alternative sources of information, the College Scorecard has the potential to help them be more confident in their knowledge of likely earnings outcomes, and therefore consider job prospects more heavily when selecting a school or major.

State Scorecard

Many states are developing their own scorecards to help students and workers select education and training programs that have demonstrated strong outcomes. Instead of using income tax data to calculate programs' employment outcomes like the federal College Scorecard, states use UI wage records housed at state workforce agencies. More than half of states report measuring outcomes for a broad array of workforce and education programs, and most of those states publicize the

information on some type of scorecard aimed at students and workers (Workforce Data Quality Campaign 2016). Some of the scorecards only have information on certificates and degree programs at the state's public colleges and universities, while others show outcomes for training providers eligible for WIOA funding, which includes for-profit career schools.

Washington and New Jersey are two states that have comprehensive scorecards. They include all types of education and training providers, and a variety of education and employment outcome metrics. Washington's Career Bridge website has descriptions for more than 6,000 programs at four-year colleges, private vocational schools, and community and technical colleges, as well as apprenticeships and training programs run by nonprofit organizations like Goodwill Industries. About 1,600 of the program descriptions include data about completion rates and postprogram employment rates, industry of employment, and average earnings, as illustrated in Table 17.3. According to a 2014 report, Career Bridge had more than 190,000 unique views that year. Of those views, 46 percent of users were students, 30 percent were unemployed workers, and 13 percent were workers searching for new careers. New Jersey has legislation that supports its scorecard website by requiring all education and training providers to submit student data to the state, which then matches that data to wage records to determine employment outcomes. A 2013 amendment to the law expanded the requirement to for-profit career schools licensed to operate in the state (Davis, Jacobson, and Wandner 2014).

While academic studies do not specifically address the effects of state scorecards on education and training program selection, state leaders and scorecard users report that these tools are influencing decisions. In New Jersey, local workforce development boards staff and American Job Centers career counselors use the state scorecard to help job seekers select training programs (Smith and Fichtner 2015). Minnesota officials have done extensive outreach to high schools to demonstrate its Graduate Employment Outcomes website for students and guidance counselors. According to state leaders, the data help counselors talk to students about career and technical education paths that don't require a bachelor's degree, but lead to jobs with good salaries. "The data that we're displaying is of unprecedented comprehensiveness and unprecedented volume," said one Minnesota official. "The data gives power to

Table 17.3 Sample of Washington State’s Career Bridge Website Performance Data

School	Program	Completion rate (%)	Employment rate (%)	Median annual earnings (\$)
Bates Technical College	Welding AAS	47	66	39,264
Green River College	Welding Technology AAS	43	77	36,196
Renton Technical College	Precision Machining Technologies AAS	73	93	48,097
Renton Technical College	Welding AAS	38	89	38,739
Shoreline Community College	Manufacturing/Machinist Technology AAS	70	82	37,294

SOURCE: careerbridge.wa.gov.

users, and it’s a new tool that career counselors can use to sit down with their students and jumpstart the conversation” (National Skills Coalition 2015). Similarly, in focus groups with students selecting colleges and majors, the new Launch My Career website in Texas helped students understand their likely future earnings for different programs of study, and influenced some to pick majors aligned with their career and earnings goals (U.S. Chamber of Commerce Foundation 2017).

PROGRAM MANAGERS: IMPROVING SERVICES

Education and workforce program administrators are increasingly relying on data analysis to improve results. They use data to identify areas with low performance and devise strategies to boost overall student and job seeker success, as well as close equity gaps in achievement.

Community Colleges

Data analysis was critical to helping Oakton Community College in Illinois more effectively serve adult students. Following consultations with area businesses that revealed a need for skilled workers in the manufacturing industry, Oakton Community College in Illinois devel-

oped a program of study in the field. The program attracted about 100 recent high school graduates, as well as about 80 students older than 23. But after reviewing data on course success, persistence, and completion, the college discovered that adult students were getting worse outcomes. Officials then made it a priority to develop strategies to serve these students and conducted surveys and focus groups to identify challenges. Based on the results, Oakton developed work-based learning components and expanded opportunities to earn credit for prior learning. The college also enhanced its performance reports for department heads to include noncredit students, since many returning adults entered the manufacturing program by taking noncredit courses. The data are disaggregated by race/ethnicity, age, and gender to highlight additional equity gaps moving forward (McCambly 2016).

Miami Dade College is working to scale this type of data analysis across the institution. College leaders monitor a handful of key metrics on persistence, completion, and postgraduation employment. In addition, the college produces more granular data analysis that is useful in adapting specific programs and policies. Administrators track the progress of student cohorts over several years, allowing them to target support services to students falling behind or make program changes to help all students do better. “For example, they can use the insights gained from the data to identify the highest-risk courses in a program of study and offer extra supports, like tutoring or group projects for students enrolled in those courses” (Association of Public and Land Grant Universities 2017). The college is building data literacy among faculty and staff with a noncredit professional development course, to ensure that information is being used for continuous improvement at all levels.

Community colleges also use labor market information to align their offerings with in-demand jobs. California Community Colleges are committed to organizing their programs around regional industry demand through the Doing What Matters initiative. The colleges use a variety of labor market information sources, including federal and state survey data. Cerritos College in Los Angeles County found information from online job ads particularly helpful when researching regional skills gaps in the advanced manufacturing industry. Although the manufacturing industry was declining overall, the detailed data revealed specialized occupations that needed more trained workers. The college was then able to focus its new programs on these in-demand skills (Dorrer 2016).

Local Service Organizations

Community colleges aren't the only entities using student data to improve programs. Many local workforce development boards are working harder to make data-driven decisions about how to serve job seekers. SCPa Works, a workforce board serving southern Pennsylvania, uses labor market information from the state and economic development research from private vendors to guide their outreach to businesses. When data suggest skills gaps in the regional workforce, SCPa Works consults with business leaders to confirm these findings and develop sector-based strategies to train unemployed or underemployed workers for these industries. New York City's workforce board uses performance data to push for continuous improvement. Using customized performance metrics for priorities like service to veterans and closer collaboration with employers, the organization increased the average earnings of program participants and is helping them find jobs more quickly (Prince, King, and Oldmixon 2017).

Some adult education providers also integrate data review into their strategic planning. The Academy of Hope adult charter school in Washington, D.C., works with more than 300 adult learners each year to help them earn a high school credential. The Academy of Hope regularly produces data dashboards to guide teaching strategies and ensure that the school meets required performance targets. The school is particularly focused on helping students at varied literacy levels to make measurable progress. Data disaggregated by literacy level, like Table 17.4, showed that higher-level students were stalling on progress. In response, the Academy of Hope revised the curriculum, increased class frequency,

Table 17.4 Percent of Academy of Hope Students Showing Measurable Skill Gains

Literacy level (from low to high)	Semester	
	Fall 2016	Spring 2017
1	67	71
2	41	56
3	40	56
4	16	22

SOURCE: Lotas (2017).

and added support from volunteer tutors. These strategies are improving progression rates for higher-level student cohorts.

NEXT STEPS: EMBEDDING DATA IN WORKFORCE DEVELOPMENT POLICY

This chapter provides examples of ways that data are influencing policy and practice in workforce development, but stakeholders are not yet using data to their fullest potential. Additional public investments are needed to:

- Build system infrastructure to improve data quality, privacy, and security. Much of the government data relevant to workforce development is being collected and managed using old technology. Upgrades could increase public confidence in data security, and provide more automated safeguards to verify data quality and ensure that a limited number of trained personnel can access confidential data.
- Enhance capacity to analyze data and present it in accessible formats. Public agencies often lack in-house experience with communicating complex data to nonexpert audiences like legislators and job seekers. Over time, more agencies are building these skill sets or hiring consultants to add capacity.
- Create partnerships with skilled researchers, such as those at universities or research centers, who can conduct program impact evaluations that present compelling evidence about what strategies are effective. Government leaders should adopt policies that enable data sharing between different agencies and facilitate use of data by external researchers, while protecting individual privacy.
- Provide data literacy training for program managers and policy leaders so they better understand how information can aid in decision making. This also provides an opportunity for data producers to build deeper relationships with these groups in order to understand what types of actionable information are needed.

Investments in data use are critical for maintaining public support for workforce development. For example, a recent executive order from the Trump administration includes a mandate for federal agencies to review data available on their workforce programs, recommend program improvements, and propose elimination of ineffective or redundant programs (White House 2017). In addition to using data to advocate for workforce development programs, the field will increasingly need to advocate for investments in data itself. We must be able to clearly articulate how data are helping to improve decision making, and ideally be able to quantify the benefits of data use in terms of improved outcomes and return on investment.

As the workforce development field expands data use, we must also ensure that data are being used ethically to help individuals and businesses succeed. Predictive analytics, which uses historical data to predict future behavior, can be useful in targeting services to individuals most likely to face challenges completing programs or obtaining employment. On the other hand, predictive analytics can be used to restrict access to services for people deemed unlikely to succeed, which is especially problematic when it perpetuates racial or socioeconomic inequity (Ekowo and Palmer 2016). If leaders are thoughtful about using data to expand rather than limit opportunities, then investments in data will help our nation build a competitive workforce that allows all individuals to find paths to success.

Notes

1. In the interest of full disclosure, note that author Rachel Zinn serves on the Academy of Hope Board of Directors.
2. Author email interview with Sasha Lotas, coordinator of research, Academy of Hope, July 5, 2017.

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