

# Planning for Higher Education Programs

## Effectively Using Data and Modeling to Understand Workforce Needs

Higher education policymakers and educators responsible for planning degree and certificate programs have a wide variety of quantitative and qualitative workforce information available to support effective decision-making. Frequently, however, the use of this information is limited to managing ongoing programs at the institutional level. But effective use of workforce data can also contribute to strategic reviews of program alignment at the state or institutional level and support broader strategic scans of occupations and fields of study in which new programs might be needed.

In May 2013, the state of Texas passed a law requiring a report on the state’s future workforce needs to help inform decisions about developing or expanding postsecondary education programs.<sup>1</sup> To respond to this request, and to guide the use of data resources, the Texas Higher Education Coordinating Board (THECB) asked the RAND Corporation to analyze options for using workforce information and recommend promising practices, as well as to develop data tools where feasible to support this effort. Although this analysis focused on the Texas context and involved Texas-specific data in addition to broader information sources, the lessons learned and tools developed could potentially guide other states and institutions in planning for workforce needs.

### Current Practices in Using Workforce Data in Texas

An initial assessment of current practices in Texas found that institutions reported available data—including public data sources, paid services, and interactions with employers and individuals to provide evidence of workforce demand—was generally sufficient for their planning needs. However, interviews and evidence from program proposals suggest that the rigor of workforce analysis varies widely and that institutions could benefit from some additional guidance on finding and using workforce data. Institutions might also benefit from improved information on postsecondary programs across the state and their capacity to meet workforce needs.

### Key findings:

- Workforce data sources provide valuable information, but the fact that each source has limitations means that no source should be used on its own.
- Workforce information should be used not only to manage new and ongoing degree programs but also for periodic strategic planning at the state, regional, and institutional levels.

In addition, although THECB staff use workforce data to validate program proposals and to create regional reports every two years for regional and institutional planning, they do not actively use workforce data to support strategic planning. Within regions, even those for which high-quality data and analysis are available, there is generally no process to systematically incorporate this evidence into higher education planning. A review of other states’ practices indicates that, as in Texas, it is more likely that states simply provide workforce data than that they also provide analytical reports that translate these data for planning purposes.

### Identifying Data Sources

Although many data sources are available that can contribute to understanding workforce needs, each individual source has its limitations. Therefore, it is important that institutions interested in using this type of analysis for higher education program planning use data from a range of sources. Among the sources available for analysis in Texas, researchers looked at those focused on individuals, on jobs, on insights from employers, and combinations of these. These included the U.S. Bureau of Labor Statistics (BLS) and Texas Workforce Commission (TWC), which provided estimates of current employment and future demand by occupation and region. The THECB contributed statistics on degrees and certificates awarded in Texas. The relatively new American Community Survey (ACS) allowed for detailed estimates of workers by occupation and region. We then paired these data with data from commercial services that allow analysis of online job

<sup>1</sup> Texas Legislature, “An Act Relating to Information Regarding Postsecondary Education and Career Opportunities and Workforce Needs in This State,” House Bill 1296, June 14, 2013. As of March 26, 2015: <http://www.legis.state.tx.us/billlookup/History.aspx?LegSess=83R&Bill=HB1296>

listings and discussions with employers and other experts, then we applied them to models that analyze workforce supply and demand, as discussed below.

### Assessing Approaches to Analyze Workforce Data

Workforce needs are often identified by comparing measures of demand for workers to measures of the supply of workers. This analysis can be done using flow modeling (i.e., comparing the new supply of workers or jobs and new demand for them) or through stock modeling (i.e., comparing the total supply and demand of workers or jobs).

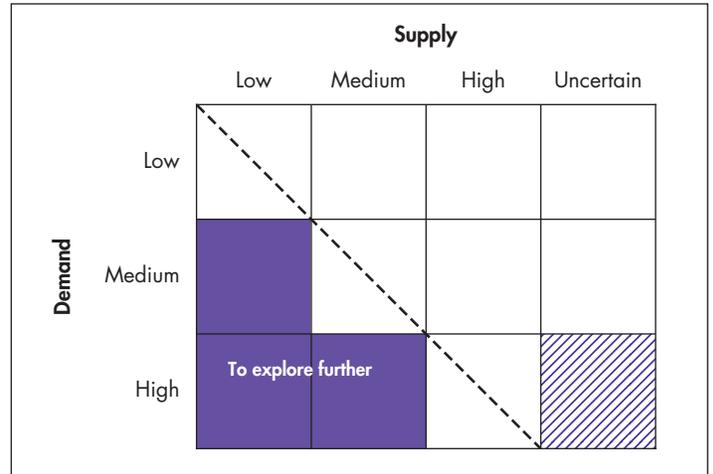
One limitation of flow models is that they generally cannot represent labor market mobility, such as geographic movement of workers or movement from one occupation to another. Stock models, on the other hand, do take into account these adjustments, but, until recently, it was not feasible to model stocks with detail in occupations, so these models were generally much less detailed than flow models. However, a relatively new data source—the ACS—allows researchers to overcome this limitation, and a new tool—the supply and demand growth matrix—was developed using a modified stock approach that allows for a more nuanced picture of workforce needs.

### Supply and Demand Growth Matrix

The supply and demand growth matrix compares the growth rates in demand projections for groups of occupations that have postsecondary needs and the growth rates of supply. Researchers first identified occupations with postsecondary needs by consulting BLS information on educational requirements, as well as reviewing the empirical distribution of workers’ education in Texas (derived from the ACS). Because data at the individual occupation level are imprecise, researchers then grouped the occupations with postsecondary needs into 66 groups. To apply the model to the Texas context, we collected data on demand projections from TWC, and we derived growth rates from available ACS data. Given the significant challenges of comparing demand and supply growth rates directly, we classified annual rates of growth in demand into equal-sized groups of high-, medium-, and low-growing occupation groups. We also classified annual growth rates in supply into three equal-sized groups.

Because the estimates of supply growth are uncertain, we classified some of the supply growth values as “uncertain” if the estimates were of low precision. However, because of a lack of information on precision for the demand growth estimates, we reported them only as high, medium, or low. By comparing growth rates in a three-by-four matrix, as shown in the figure, we could produce matrices at the state level and for each of the ten THECB regions.

### Supply and Demand Growth Matrix Structure



We noted occupation groups that fell below the diagonal, such as those in the high-demand, low-supply cell, as good candidates to explore further to identify unmet workforce needs. Because of the uncertainty, it is also necessary to examine the high-demand, uncertain-supply cell.

To meet the needs identified in the highlighted cells, the matrix can be used in conjunction with the following data for workers in each occupation: current distribution of education level, fields of degree for bachelor’s degree holders, and median annual earning. These data can help identify occupational groups and regions for further exploration, so it is essential to engage institutions, employers, and other knowledgeable observers to collect local and regional perspectives on workforce needs and the appropriate postsecondary programs to meet them.

### Limitations of the Tool

As with all statistical measures of the labor market, the supply and demand growth matrix depends on some assumptions that could cause the estimates of future supply and demand to differ from actual experience. As a result, it is essential to use this tool in conjunction with the perspectives of institutions, employers, and other experts.

### Recommendations

Researchers provided recommendations to stakeholders in Texas that might also be useful to educators and policymakers in other states who would like to use workforce data to more effectively and strategically develop, manage, and evaluate degree and certificate programs.

Stakeholders should improve planning processes by systematically integrating workforce analysis, including taking the following steps:

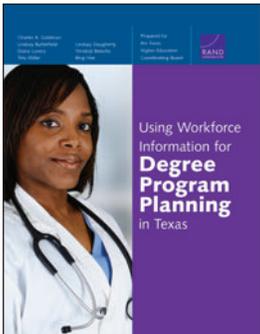
- *Use workforce data for regular strategic planning.* States and institutions should promote proactive workforce data use through regular strategic planning, including systematic analysis of data to help identify unmet needs earlier and mobilize resources to meet those needs. For example, state agencies could develop a priority-setting process based on fields of study with critical statewide or regional shortages using the supply and demand growth matrix. It is important that discussions with industry representatives, and potentially additional sources of statistical data, complement these tools to validate their indicators.
- *Provide guidance to institutions on appropriate data use.* Institutions might benefit from a website designed to provide access to a wide range of data resources, important information on these resources, and examples of promising practices in using workforce data for program planning. In some cases, the state might need to set requirements for using workforce data. For example, in the program-approval process, requiring institutions to provide data from a common set of resources might guard against selectively including only data that support the proposal.

In addition, because each information source has its own strengths and weaknesses, stakeholders should take steps to enhance data resources for planning by doing the following:

- *Develop approaches to systematically engage employers.* Although many institutions already engage employers and industry experts, ensuring a routine and systematic

approach can help foster input from employers more efficiently. States might want to explore tools that have been designed to gather regular employer input (e.g., those developed by the Center for Employability Outcomes at Texas State Technical College) and determine whether these tools can inform program development across the state.

- *Identify strategies to explore emerging trends.* Because large-scale public data sources take time to update, they might not provide accurate information on current trends, especially for applied programs that would link closely to local employers with changing occupations or in emerging industries. Job posting data, available through commercial services, might provide the most efficient method of getting data on these emerging industries and occupations. Direct engagement with employers and tools to systematically solicit employer input might also be useful in identifying emerging trends.
- *Assess existing capacity.* Institutions might have trouble assessing the levels of capacity at other institutions in their regions to address a particular workforce need. Therefore, it might be worthwhile to collect information on program capacity periodically to simplify institutional planning and discourage duplicative efforts.
- *Provide access to major data resources.* Vendor tools that could be useful to institutions and states might, in some cases, be used unevenly across institutions because of the cost of licenses to access them. States should explore cost-effective ways to achieve statewide access to these tools in an effort to ensure that institutions are using a common set of data resources.



This brief describes work done in RAND Education documented in *Using Workforce Information for Degree Program Planning in Texas*, by Charles A. Goldman, Lindsay Butterfield, Diana Catherine Lavery, Trey Miller, Lindsay Daugherty, Trinidad Beleche, and Bing Han, RR-1011-CFAT, 2015 (available at [www.rand.org/t/RR1011](http://www.rand.org/t/RR1011)). To view this brief online, visit [www.rand.org/t/RB9832](http://www.rand.org/t/RB9832). The RAND Corporation is a research organization that develops solutions to public policy challenges to help make communities throughout the world safer and more secure, healthier and more prosperous. RAND is nonprofit, nonpartisan, and committed to the public interest. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors. RAND® is a registered trademark. © RAND 2015

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