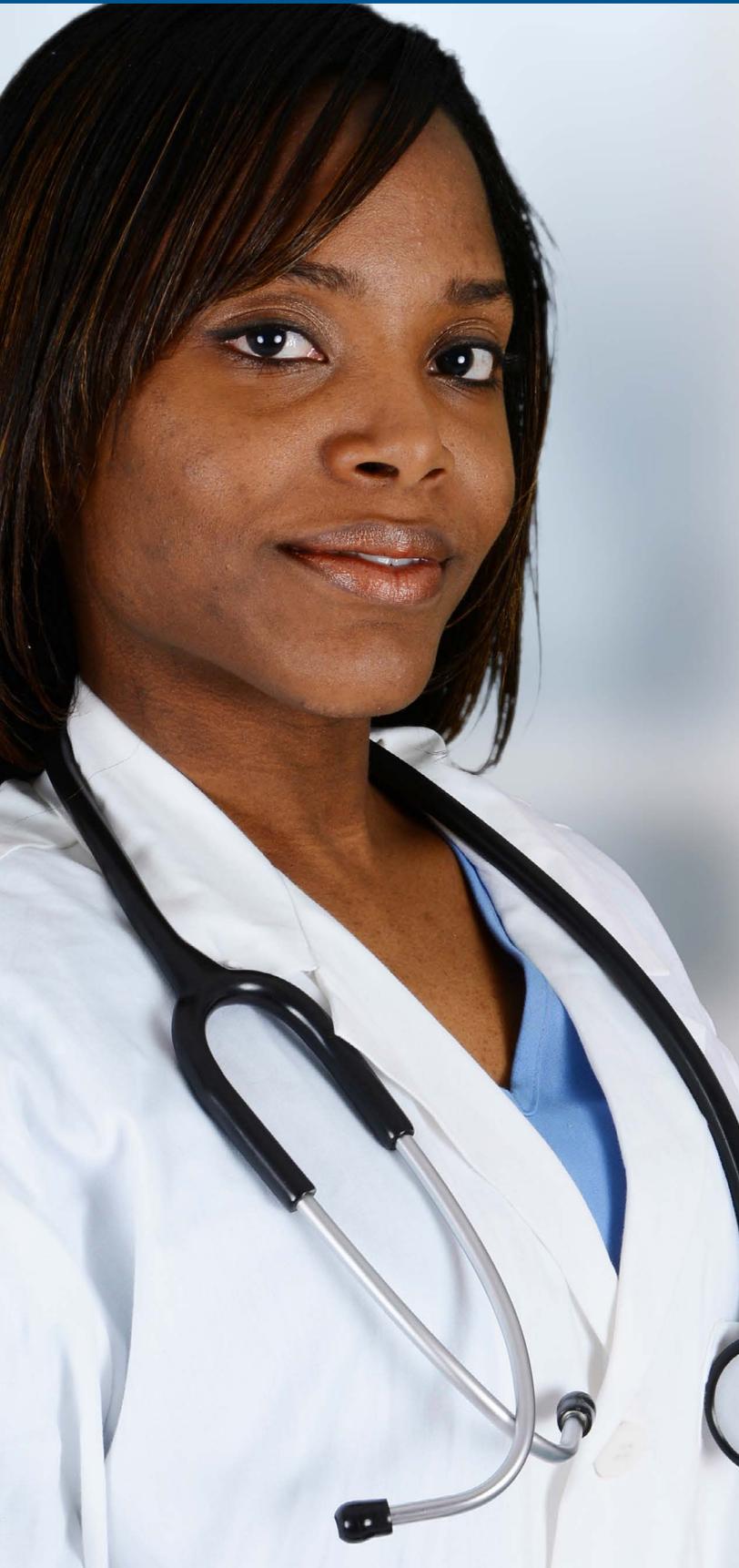Charles A. Goldman
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RAND CORPORATION

Using Workforce Information for **Degree Program Planning** in Texas

Summary

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Preface

In May 2013, the Texas Legislature passed House Bill 1296, requiring the Texas Education Agency to distribute information to public school students about higher education institutions and workforce needs in the state. Specifically, the bill calls for comparisons on higher education institutions in terms of tuition costs, student debt, retention and graduation rates, and employment outcomes. The bill also requires disseminating the Texas Workforce Commission (TWC) projections of future occupational demands and annual wages for the jobs in highest demand.

The bill further requires the Texas Higher Education Coordinating Board (THECB), in conjunction with TWC, to prepare a report on Texas's future workforce needs that would help inform decisions to develop or expand postsecondary education programs. This portion of the bill is the motivation for the present report.

Educators and policymakers in Texas and elsewhere have a wide variety of quantitative and qualitative workforce information available for planning degree and certificate programs in colleges and universities. To help guide use of such resources, The College for All Texans Foundation, which works to further the objectives of THECB, asked RAND Education, a unit of the RAND Corporation, to conduct this study. It examines the quantitative and qualitative sources of information on workforce needs. It reviews common techniques for quantitative modeling using workforce data, as well as how institutions and states may use these data to inform decisions about degree programs. It also develops some data tools and recommends ways to use workforce information in degree program planning.

This study was made possible by the generosity of the Houston Endowment.

This document is a summary of the full report. The full version of the report is available at www.rand.org and at www.thecb.state.tx.us.

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Summary

In May 2013, the Texas Legislature passed House Bill 1296, requiring a report on Texas's future workforce needs that would help inform decisions to develop or expand postsecondary education programs. Educators and policymakers in Texas and elsewhere have a wide variety of quantitative and qualitative workforce information available for planning degree and certificate programs in colleges and universities. Such information can serve at least three major purposes: (1) strategic review of program alignment at the state or institutional level; (2) a broader strategic scan of occupations and fields of study where new programs may be needed; and (3) institutional proposal development for the opening and closing of programs, and the subsequent review of these proposals by the state.

To guide the use of these data resources and to respond to the legislative requirement, the Texas Higher Education Coordinating Board (THECB) asked the RAND Corporation to:

- describe current practices in using workforce information for degree program planning in Texas and elsewhere;

- analyze options for using workforce information and recommend promising practices;

- develop data tools, where feasible; and

- apply these tools and describe findings.

The report is based on a literature review, interviews with state officials and institutional representatives, and quantitative analysis of workforce data.

Data Sources and Services

Data sources available for planning and modeling purposes include those on individuals, on jobs, and on insights from employers, as well as combinations of these. This project reviews the following commonly used data sources and services:

- The **American Community Survey (ACS),** which allows detailed estimates of workers by occupation and region.

- **Bureau of Labor Statistics (BLS)** and **Texas Workforce Commission (TWC)** data, which provide estimates of current employment and future demand by occupation and region.

- **THECB** statistics on degree and certificates awarded by Texas higher education institutions, by field of study and degree/certificate level.

- Commercial services that allow analysis of online **job listings.** These services can show trends in demand for occupations and can often provide data much more rapidly than the BLS and the TWC. Content analysis tools allow examination of the education and skill requirements for positions.

- Statistical data capture only certain features of the labor market, so discussions with **employers** and other **experts** (e.g., professional leaders) play an essential role in further understanding workforce needs both in terms of quantity and the qualities or skills required to fill these needs.

To use workforce data for program planning, it is essential to link occupations to fields of study. The U.S. Department of Education provides a tool to match occupations to closely related fields of study, but it typically matches only a few fields to each occupation, which is especially limiting for bachelor's and graduate programs, which can lead to preparation for multiple occupations.

Key Findings and Recommendations

All of the data sources in the previous section can contribute to understanding workforce needs and hence planning for higher education programs. But each data source has important limitations, so none of the sources should be used on its own. It is important to use data from a range of sources, including quantitative data and conversations with the business community, before making decisions to open and close new degree and certificate programs or to change existing programs to align them with labor market needs.

> **Workforce information should be used in Texas not only to manage new and ongoing degree programs, but also for periodic strategic planning at the state, regional, and institutional levels.**

Workforce information should be used in Texas not only to manage new and ongoing degree programs, but also for periodic strategic planning at the state, regional, and institutional levels. In preparing proposals, Texas institutions would benefit from clear guidance on the sources of data to use and easier methods of accessing them. In particular, more systematic means of engaging employers would help both the state and institutions to align degree programs with workforce needs.

Approaches

In the report, we identify and describe a number of methods to analyze workforce data. Workforces can be analyzed using stock or flow concepts. Stocks represent the total quantity of workers or jobs at a point in time (past, present, or future). Flows represent changes over time (often annually).

A typical flow model compares the annual need for new workers, stemming from both occupational growth and replacement of workers who leave the occupation, with the annual production of degrees and certificates within the state or region. A typical stock model compares the current and projected stock of employed workers to the total and projected supply of workers in the same occupation. Both stock and flow models then must translate gaps in supply into demand for academic programs, in terms of degree level and field of study. The models must finally compare the current and projected capacity of postsecondary programs for these degree levels and fields of study to meet the occupational demands.

Flow models generally cannot represent important mobility in the labor market, where workers move geographically and from one occupation to another. While stock models incorporate these adjustments, until recently, it was infeasible to model stocks with detail in occupations, so these models were generally much less detailed than flow models. As we discuss on the following pages, a new data source allows us to overcome this limitation.

Much of the practical use of workforce data does not follow formal stock or flow models. Instead, users generally rely on specific indicators that are related to growth in demand or imbalances between supply and demand. Commonly used indicators are "hot jobs" or rapidly growing occupations, wage changes, or vacancy rates. All of these indicators may point to unmet needs in the workforce.

Current Practices in Using Workforce Data

At the state and regional level, there is a significant amount of data available. Workforce data are being used for planning and program development at the state, regional, and institutional levels in a variety of ways.

Institutional Planning

Institutions rely on public data sources, paid services, and interactions with employers and individuals to provide evidence of workforce demand. Institutional representatives report that, with a few exceptions (e.g., need for more current data and for data on emerging industries and occupations), available data are sufficient for their planning needs. However, our interviews and our review of the workforce evidence submitted in postsecondary education program proposals suggests that the rigor of workforce analysis varies widely and that institutions may benefit from some additional guidance on the availability and use of workforce data. Institutions may also benefit from improved information on postsecondary programs across the state and their capacity to meet workforce needs.

Institutions rely on public data sources, paid services, and interactions with employers and individuals to provide evidence of workforce demand.

Strategic Review and Priority Setting

THECB staff use workforce data to validate institutional data in program proposals and create biannual regional reports that provide workforce data to support regional and institutional planning, but they do not actively use workforce data to support strategic planning. Some regions provide high-quality, region-specific data and analysis, but there are generally no processes to systematically incorporate this evidence into higher education planning. Our interviews suggest that the data provided by the TWC is extremely helpful but that the state might also provide data on larger trends in the workforce. On a somewhat different note, some interviewees also suggest that the state should standardize degree program offerings more to meet employer needs consistently across the state. A review of other state practices indicates that it is common for states to simply provide workforce data. It is much less common for states to provide analytical reports that translate these data for higher education planning.

Data Tools and Results

Flow modeling has been widely used for many years, and our analysis did not uncover any major practical improvements we could make in these techniques. Stock modeling, however, offers some new opportunities. While stock models have been restricted to quite general analysis because detailed data on employed workers were not available, the ACS generates data that can now be used to estimate historical (and future) supply of workers in each occupation group for the state as a whole and within each region. We develop a new matrix tool to compare these supply estimates to existing TWC estimates of demand.

To implement this idea, we begin by selecting the occupations that have postsecondary needs and group them into somewhat larger occupational groups. Our basic approach is to compare the growth rates in existing TWC demand projections for these occupational groups to the growth rates of supply derived from available ACS data. Because it is infeasible to compare the demand and supply growth rates directly, we classify annual rates of growth in demand into equal-sized groups of high-, medium-, and low-growing occupation groups. We also classify the annual growth rates in supply into three equal-sized groups.

Because the estimates of supply growth are uncertain, we also classify some of the supply growth values as "uncertain" if the estimates are of low precision. We do not have information on precision for the demand-growth estimates, so we report them only as high, medium, or low. We compare these growth rates in a three-by-four matrix, as shown in Table S.1. We produce matrices at the state level and for each of the ten THECB regions.

Occupation groups that fall below the diagonal, such as those in the high-demand, low-supply cell, are good candidates to explore further to identify unmet workforce needs. The following groups are in the statewide matrix:

■ Religious workers

■ Other construction-related workers

■ Air transportation workers

The high-demand, medium-supply cell also sits below the diagonal and includes the following:

■ Financial specialists

■ Computer specialists

■ Engineers

■ Primary, secondary, and special education school teachers

■ Health technologists and technicians

Table S.1. *Supply and Demand Growth Matrix Structure*
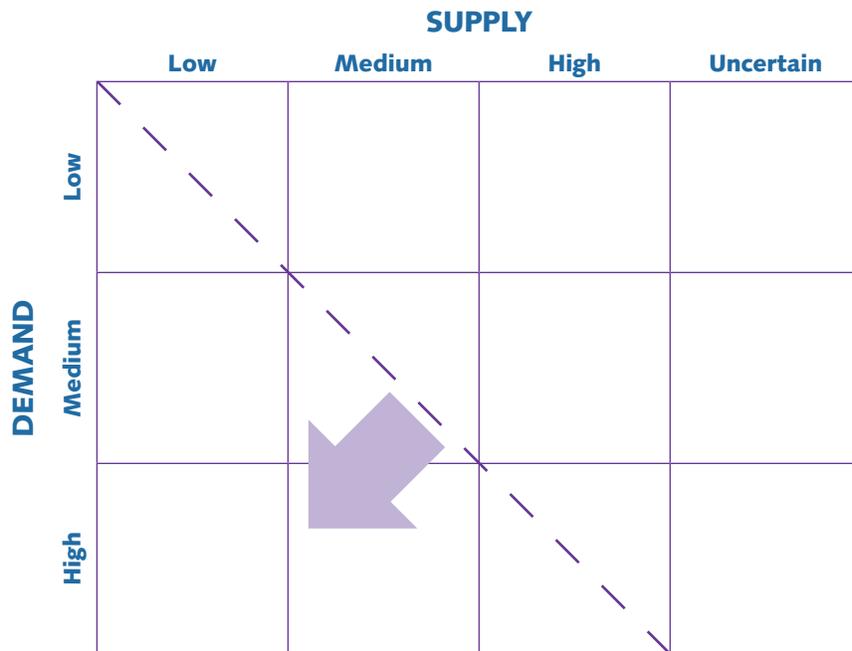
Because of the uncertainty, it is also necessary to examine the high-demand, uncertain-supply cell, which includes the following:

- Mathematical science occupations

- Architects, surveyors, and cartographers

- Physical scientists

- Legal support workers

- Occupational therapy and physical therapist assistants and aides

Supplementary files provide matrices for each of the 10 THECB regions in Texas to guide regional planning.

We also prepare other tools using the ACS data that can be used to improve both stock and flow modeling. Specifically, these tools provide the following data for Texans working in each occupation:

- Current distribution of education level

- Fields of degree for bachelor's degree holders

- Median annual earnings

These tools work in conjunction with the supply and demand matrices to identify postsecondary programs appropriate to meet the needs shown in the matrix. These tools can help identify occupational groups and regions for further exploration. In these cases, 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 Tools

As with all statistical measures of the labor market, the supply and demand matrices depend on a number of assumptions, which may cause the estimates of future supply and demand to differ from actual experience. As a result, it is essential to use these tools in conjunction with the perspectives of institutions, employers, and other experts.

Recommendations

Improve Planning Processes

Workforce data can be used to improve higher education planning at the state, regional, and institutional levels. Our assessment of the ways that data are currently used in Texas higher education planning suggests that more could be done to systematically integrate workforce analysis to improve planning. We provide several recommendations on ways that planning processes can better incorporate workforce data.

Use Workforce Data for Regular Strategic Planning. We recommend that the state and institutions shift some efforts toward proactive data use through regular strategic planning. By more systematically and regularly analyzing workforce data, the state and institutions may be able to identify unmet needs earlier and mobilize resources to meet those needs. For example, the THECB could develop a priority-setting process based on fields of study with critical statewide or regional shortages. The supply and demand matrices may be useful for setting priorities. But these tools must be complemented by discussions with industry representatives, and potentially additional sources of statistical data, to validate their indicators.

Provide Guidance to Institutions on Appropriate Data Use. Institutions may 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 may 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 may guard against selectively including only data that support the proposal. This approach will also allow the THECB to build expertise with specific data resources in order to validate the evidence provided in proposals.

Enhance Data Resources

While workforce analysis can provide important evidence for the planning process, none of the data sources we identified provide a complete picture of the workforce. Each has strengths and weaknesses. So it is important to consider data from a range of sources, including quantitative data and conversations with the business community, before making decisions to open and close new degree and certificate programs. We provide several recommendations on ways to enhance data resources for planning.

Develop Approaches to Systematically Engage Employers. Institutional representatives we interviewed, particularly those from community colleges, are regularly and systematically engaging employers and industry experts, but they suggest that a more routine and systematic approach is needed to foster input from employers efficiently. The state may want to explore tools that have been designed to elicit 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. Large-scale public data sources take time to update. Institutions worry that these sources cannot inform them about 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, may 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 may also be useful in identifying emerging trends.

> The state should explore whether there are more cost-effective ways to achieve statewide access to data tools in an effort to ensure that institutions are using a common set of data resources.

Assess Existing Capacity. Several institutions cite difficulties in assessing the level of capacity at other institutions in their region to address a particular workforce need. 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 the state are used unevenly across institutions. In some cases, the cost of licenses to use these tools may prevent institutions from accessing them. The state should explore whether there are more 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.

Acknowledgments

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