California Postsecondary Education Commission

Developing a System to Compare Degree Production with Labor Market Demand

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One of the major benefits of higher education is that it prepares students for careers. Education that qualifies students for better jobs reduces inequality by offering all Californians the opportunity to qualify for rewarding careers and helps businesses in the state by providing them with a skilled, productive workforce.

While the goal of meeting labor market demands should not be the sole objective of postsecondary education, there is an increasing awareness that a knowledge-based economy is directly dependent on its higher education system. Given this dependence it is imperative that greater efforts be made to match the production of degrees and certificates by the state's colleges and universities with the demands of the labor market.

While no one would argue that the changing demands of the economy should be the sole determinant of resource allocation for higher education, it is equally apparent that the linkage between higher education and workforce demands is weak. Funding and resource allocation are generally based on factors internal to the institution or system such as faculty, enrollment demand, or grant dollars and are often informed only at the margins by labor demand.

There is currently no strong mechanism that connects the supply of higher education to the demand of the labor market. There is little coordination between higher education program development and the overall needs of the workforce. Matching the outputs of higher education to the demands of the economy will always be imprecise.

Occupational projections

An assessment of whether production of degrees and other qualifications matches the needs of the labor market can be made using occupational projections developed by state and federal labor agencies. The California Employment Development Department (EDD) regularly releases projections giving a breakdown of jobs openings over the next 10 years by occupation. In a recent fact sheet, the Commission compared these projections with degree production by California colleges and universities. The EDD projections show that 25% of California's job openings will requires a bachelor's degree or higher and that the State may not be producing enough university graduates to meet this demand.

The occupational projections include estimates of job openings in a wide variety of occupations. These projections could be used to compare the number of degrees or certificates in a particular subject with the number of job openings in occupations for which this degrees or certificate is useful. This information would allow policymakers to assess whether California colleges and universities are underproducing or overproducing a qualification of a particular type and whether students wishing to become qualified for better careers would be better served if funds were redirected from one program to another.

The EDD projections are based on certain assumptions of industry growth and the job mix within industries. Staff has conducted an analysis of the methodology used in the projections so that, if needed, the projections can be adapted to reflect other views on economic trends in the state.

There are three steps in making the occupational projections:

1. Develop a projection of employment by industry;
2. Develop a staffing patterns matrix showing the breakdown of jobs by occupation in each industry. Apply this matrix to the projection of employment by industry to give a projection of employment by occupation; and
3. Develop a training level schedule showing the qualifications required for each occupation. Apply this schedule to the projection of employment by occupation to give a projection of the number and types of qualifications required by the labor market.

The projections can be adjusted by making changes in any of the three steps in the process:

1. The industry projections can be modified to match projections made by other organizations doing economic forecasting;
2. The staffing pattern for any industry can be modified, for example, if more specific information on trends in the composition of jobs in an industry is available from a trade association; and
3. The qualifications required for any occupation can be changed if industry groups believe EDD's assessment of the qualifications needed does not reflect industry practice.

Projection of employment by industry. The industry projections as provided by the Employment Development Department (EDD), display the predicted employment changes within each sector over a decade. The projections are based on historical data as well as current information. Information from payroll data is collected through employers, as well as government agencies.

The process involved in calculating industry projections by the EDD is done in two main steps. The first step uses a mathematical model to create industry projections by sector. Then projections take into consideration historical employment of a particular area, the projected industry employment for a particular area, as well as the latter two factors combined in relation to the same sector's employment for the state as a whole. Following this, the projections are then divided into projections for specific industries within the sectors. Local analysts that are acquainted with the different components then rectify the projections as they see fit.

With the base year as 2002, and a target year of 2012, EDD projected growth in employment in several industries. Of note is the projected increase (26%) in the health care and social assistance industry. Similarly, EDD indicated an increase of 21% in accommodation and food services by 2012, and an increase of 30% in the construction industry (see Table 1).

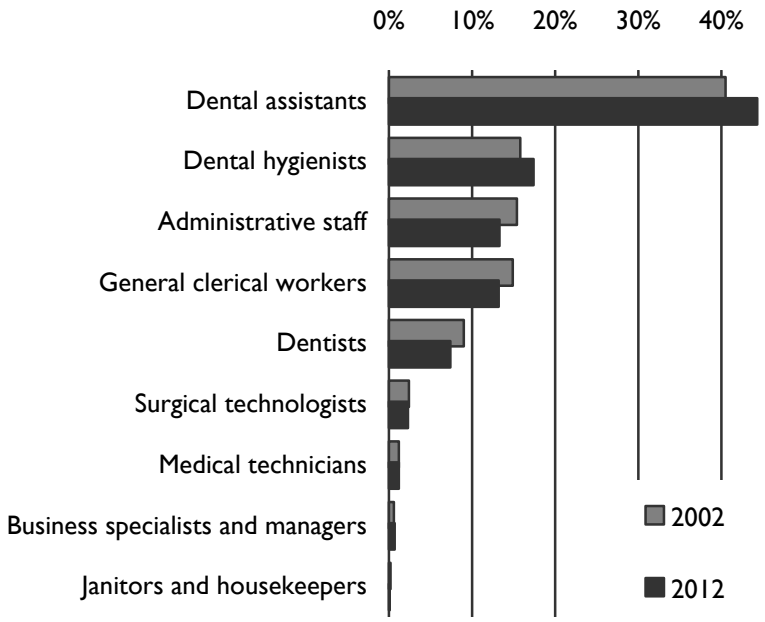
Table 1. Projected job growth by industry

	Employment in 2002	Job Growth 2002–2012
Mining	20,300	-1.5%
Utilities	54,800	9.3%
Construction	773,500	30%
Manufacturing	1,638,200	1.6%
Wholesale trade	652,100	18%
Retail trade	1,581,100	17%
Transportation and warehousing	436,200	18%
Information	497,300	16%
Finance and Insurance	584,600	14%
Real estate and rental and leasing	268,300	20%
Professional and technical services	905,000	20%
Management of companies and enterprises	270,500	15%
Administrative and waste services	938,800	37%
Educational services	245,500	35%
Health care and social assistance	1,253,400	26%
Arts, entertainment, and recreation	229,800	28%
Accommodation and food services	1,152,600	21%
Other services except public administration	505,700	14%
Public administration	2,447,100	17%

Staffing pattern matrix. The staffing pattern matrix lists the various occupations that can be found within different industries. The data collected detailing the number of workers employed in different occupations comes from a survey that is distributed to over 100,000 employers in California, employers who are intended to be representative of all employers in the state. The employers record how many of their employees work in each of the almost 800 occupations that are listed. The results of these surveys collectively imply staffing patterns that are found within different industries. The responses that are collected are then summarized, after which they are expanded to produce the annual average employment level for the main industries. This results in the estimate for employment in each occupation for the base year being considered. The staffing patterns are then adjusted to take into account technological changes that are predicted, based on special studies conducted by the Bureau of Labor Statistics. The adjusted results are then used as the staffing pattern projection for the target year.

A depiction of a staffing pattern can be seen by looking at dental offices. As shown in the graph on the following page, dental offices need to employ people that provide a variety of dental services. Technicians and assistants that specialize in different aspects of dental work are required in the offices. In 2002, dental assistants made up 41% of total employment in dental offices, and that proportion is projected to increase to more than 44% in 2012. Clerks of various kinds also play a significant role, making up almost 14% of total employment in 2002. Dentists, on the other hand, made up 9.1% of those employed in 2002, and that number is expected to decrease to 7.4% by 2012.

Staffing pattern for dentists' offices



BLS training level. The Bureau of Labor Statistics has developed a classification system for occupations based on their training and education level requirements. Occupations are assigned to a training level category based on information collected in the Occupational Employment Statistics survey and the Current Population Survey.

The training level category that an occupation is assigned to is based on the qualifications of most workers in the occupation and the qualifications that employers typically look for. The categories range from professional and doctoral degrees to various lengths of on-the-job training. Some occupations, such as dentists, require a professional or doctoral degree. Other occupations require only a bachelor's or an associate degree. Some occupations, such as many managerial positions, require only prior experience in a related occupation. Many occupations require only on-the-job training of various amounts. The amount of on-the-job training is determined by how much training is needed for the employee to be able to develop the appropriate skills and perform at an adequate level. For example, maintenance and repair workers often require an extended length of time to develop the skills they need and have to go through long-term on-the-job training. Clerks and aides can often develop their necessary skills through short-term on-the-job training.

Adjusting the projections

Staff has begun work on a system to make the projections more flexible. The large number of statistics can be made more manageable by condensing the 760 occupations listed by the BLS. The occupations were combined if they were determined to be similar after examining their wages, education and training level, as well as the main characteristics the job. For example, the occupations titled "short order cook," and "fast food cook" were combined. A particular education or training level was not required for either occupation, and they were both listed as having a median hourly wage of $8. A restaurant cook could not be grouped with these occupations, however, because they are listed as having a training level of long-term on-the-job training.