San Benito County Site Projections

Introduction

On March 2, 2004, Gavilan College district voters approved Measure E, a facilities improvement bond intended to fund Gilroy campus renovations and upgrades and expand facilities in San Benito County (SBC) and the Greater Morgan Hill area. In Spring 1997, an instructional site was established in San Benito County. Since being established, a variety of courses and services have been provided to students at this SBC site. Enrollment and services have varied from year-to-year due to largely limitations in facilities, funding, and personnel. The most recent academic year (2009/2010), the total Full Time Equivalent Student (FTES) attributed to the SBC site was 282.26.

As a part of the plan to expand course and service offerings in San Benito County, the current study was constructed to predict potential student enrollment. The projection, while consisting of a statistical procedure, necessitates a firm understanding of the numbers and factors that are entered into the equation. As with all projections, the current study relies upon estimates and assumptions to guide projected student enrollment.

Methods

In order to provide both background to the projection as well as variables to predict enrollment, a master database was established. The master database was composed of data from three areas:

Gavilan College: FTES, Weekly Student Contact Hours (WSCH), Headcount, headcount of students who lived in San Benito County, percentage enrollment change and percentage of total headcount who lived in San Benito County.

Hollister site: Fall FTES, academic year FTES, and percentage of Gavilan College FTES attributed to the Hollister site.

San Benito County: Unemployment rate, county population, 12th grade enrollment, and housing units.

Of these variables five had projection data through 2018. Headcount, WSCH, and Percentage enrollment change were predicted by the California Community College Chancellor's Office (CCCCO). For more information of the projection model and variables entered see http://www.cccco.edu. SBC housing units and unemployment prediction data were provided by an Association of Monterey Bay Area Governments Housing Element study (http://www.amtag.org/reports/index.html). SBC population was projected by the California Department of Finance (http://www.labormarketinfo.edd.ca.gov) and 12th grade enrollment was projected by the California Department of Education (http://www.cde.ca.gov/index.asp).

An Auto Regressive Moving Average (ARIMA) was selected to forecast student enrollment. The ARIMA method can be particularly useful to reduce error of prediction based not only on known past patterns but also for unknown future effects. A variety of variables were tested as predictors. In order to increase to predictive power and achieve parsimony, SBC population
and 12th grade enrollment were used to forecast SBC student headcount. The same procedure was also used to forecast SBC students' FTES.

Developing a prediction model from existing SBC site FTES data is clearly problematic. Enrollment at the current Hollister site has been restricted by classroom space and course offering factors all of which create trend data that would not accurately predict the future if these restrictions were not in place. To illustrate, past enrollment increases seen in the District overall have not been observed at the Hollister site (See Diagram 1). Thus, using observed data that is restricted to build a future trend is inappropriate. Conversely, 100% of those students from San Benito County will not choose, for a variety of reasons, to enroll in the any expanded SBC offerings and facilities. In an effort to balance potential enrollment (SBC student projected enrollment) and any potential leakage of those students to the Gilroy campus, it was decided that the lower confidence limits of the forecasts would be more appropriate to use.

Results

In an effort to document the differences between Gavilan College enrollment and SBC site trends, a chart was developed (See Diagram 1). Over the same period, Gavilan College FTES increased 31.24%, while SBC site FTES decreased by 7.26%.

Diagram 1: Hollister site FTES, SBC county student FTES, and total GC FTES over time
Using an AIRMA procedure, San Benito County Fall student enrollment was forecast using SBC population and SBC 12th grade population as independent variables (See Table 1). The total model adjusted $R^2$ was .658 (See Diagram 2).

**Table 1: Projection of Fall SBC student enrollment from SBC and SBC 12th grade population**

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<td>1796</td>
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<td>1895</td>
<td>1838</td>
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**Diagram 2: Projection of SBC student enrollment from SBC and SBC 12th grade population**

Using an AIRMA procedure, San Benito County student FTES was forecast using SBC population and SBC 12th grade population as independent variables (See Table 2). The total model adjusted $R^2$ was .773 (See Diagram 3).

**Table 2: Projection of SBC student academic year FTES from SBC and 12th grade population**

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Diagram 3: Projection of SBC student academic year FTES from SBC and 12th grade population

Summary

While forecasts are vital elements of any planning process, results represent a series of assumptions and limitations. Forecasting models rely on predictions from additional sources to set future enrollment trends. For example, the current projections rely upon education and population projection data produced by California Department of Education and the California Department of Finance, respectively. Thus, the current study projection of potential FTES is only as valid as the projection data from these other sources. Moreover, any forecasting model relies upon past patterns to project future growth. As evidenced by recent events, unforeseen factors can greatly influence trends in the economy and subsequently the educational system.

Recognizing the limitations of forecasting, the projection results suggest slow and steady growth in the number of students who come from San Benito County (See Table 1) with a total increase of 9.05% from Fall 2010 to Fall 2018. This represents a 1.13% annual increase.

Similar, but greater, increases were found with the academic year Full Time Equivalent Student forecast (See Table 2). The total number of FTES from 10/11 to 18/19 academic year is projected to increase 24.12%, which represents a 3.02% annual increase (See Diagram 3).

Clearly, not all students from San Benito County will attend a future expanded facility. For example, because of lab or physical education facilities, students may need or want to go to the Gilroy campus. Moreover, distance education enrollment is likely to continue its steady increase. In order to address these probabilities, a reduction method was selected using the lower confidence limits in the FTES forecast. The lower confidence limits of the SBC student FTES projection found an increase of 29.43% from 10/11 to 18/19, representing a 3.68% increase per year. Thus, an estimate of the total number of FTES in 2018 is 1,927. While the current forecasts are not a guarantee of future enrollment, it appears from these procedures that considerable growth is possible in San Benito County if facilities, courses, and services are available.