ABSTRACT

This paper examines alternative techniques for projecting freshman enrollment in specific academic departments. Departmental enrollment projections provided by four different projection models are compared to actual departmental enrollments at a selected institution. Two of the models use only historical data, while the other two models are sensitized to current developments as indicated by the expressed major choices of prospective freshmen. The use of discriminant analysis to establish differential enrollment probabilities is also explored.

Although different models do a better job for different curricular departments, the smallest mean squared error across all departments was obtained with the simplest projection technique. The use of the preliminary major choice of prospective freshmen did not improve departmental projections, and the student characteristics explored in this study did not differentiate enrolled from non-enrolled students adequately enough to improve enrollment projection accuracy.

Based on the results obtained at this one institution, therefore, it would appear that simple and straightforward projection models can be as useful as complex and sophisticated models.

Enrollment projection models derive from the earliest budgetary processes used at colleges and universities. Implicitly – if not explicitly, – the development of a budget involves some estimate of enrollment during the budgetary year. Typically the projection models were designed to estimate an institution’s total enrollment (e.g. Hoyt and Munday, 1968, pp. 119–22), and for many years this estimate was considered adequate for the planning and budgetary cycles. More recently however, with the application of the Planning, Programming, and Budgeting System (PPBS)

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to higher education, with the development of simulation models and with the recognition of cost differentials associated with different programs offered within the institution, more detailed enrollment projections are required. In addition, as planning is decentralized to lower level units such as schools or academic departments, decentralized enrollment projections are necessary to determine faculty loads, staffing requirements, space allocations, etc.

This paper, therefore, examines alternative enrollment projection models designed to predict enrollment in specific institutional categories or departments. Because enrollments in specific departments vary from year to year, and because the proportional variation in departments may be greater and in a different direction than the variation in total institutional enrollment, the results of departmental projections at a selected institution are compared — with two models using only historical data and with two models sensitized to current developments as indicated by the expressed major choices of prospective freshmen.

Wasik (1971) classified enrollment projection models into three categories: (a) extrapolation models that use cohort data to develop straightline extrapolations or linear regression equations to estimate enrollment, (b) structural flow models that use differential equations to estimate the flow of individuals through the system, and (c) Markov chain models that use a transition matrix to estimate the movement of students through or between different departments. In this paper we explain and test two simple extrapolation models: a structural flow model based on current information of the expressed major choices of prospective freshmen, and a Markov transition model that combines current information on major choice with the probability of enrollment in other departments.

Procedure

Since pre-enrollment data routinely collected by The American College Testing Program (ACT) were used as the projection data, and since the results of the projections were compared to actual enrollment, it was important to pick a college where freshmen typically select a major and where incoming students are required to take the ACT battery. Kansas State University (KSU) satisfied these requirements and was selected after officials there expressed a desire to participate in such a study.¹

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