

Developing Effective Policy Analysis in Higher Education

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NUMBER 76, WINTER 1992 JOSSEY-BASS PUBLISHERS Policy analysis provided the framework for enrollment planning in the Arizona University System. An initial statement, developed by an analyst and approved by policymakers, serves as a guide for the new planning paradigm. Independent environmental factors are the foundation of the planning paradigm.

Enrollment Demand in Arizona: Policy Choices and Social Consequences

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The underlying patterns of enrollment demand throughout postsecondary education are shifting. Depending on the region of the country, these patterns are heavily influenced by a declining number of high school graduates, returning nontraditional students, ethnic minority populations becoming majorities, increasing college-going rates for women, and individual economic imperatives. Throughout the 1980s, states struggled to cope with these changes through a variety of analytical mechanisms, the most prevalent of which were demographic projections used to predict postsecondary enrollments. Unfortunately, the planning that resulted from these efforts was often based on erroneous assumptions. Consequently, many of the actions taken as a result of the planning of the 1980s were harmful. The lesson for the 1990s is that we can no longer rely on simple demographic models that translate the college-age population figure into college enrollment projections (Frances, 1989).

A New Planning Paradigm

The Arizona University System was facing the prospect of significantly increasing enrollments. How many students? Unknown. From which socioeconomic backgrounds? Unknown. In what geographical regions of the state? Unknown. We had a sense of an impending enrollment explosion, but we did not know when or why. And, most important, we were unsure of the consequences of the policy interventions that we might choose to employ to meet future enrollment growth. We were concerned that unintended consequences would have as important an effect as the intended purposes of our policy preferences.

Clearly, a new planning paradigm was needed for examining enrollment growth in a systematic and comprehensive way, a paradigm capable of considering the interactive effects of changes in the demographic characteristics of the population, as well as its size; changes in education and student aid policies; changes in economic, social, and political trends; and changes in individual institutional management strategies. In October 1989, the chair of the Strategic Planning Committee of the Board of Regents and I authored a memorandum to the board in which we enumerated four principles for planning for enrollment growth: (1) Provide access to higher education for all residents of Arizona who meet reasonable admissions standards. (2) Admission of qualified nonresident students benefits Arizona residents by creating academic, social, and cultural diversity and provides important economic support to the university system and Arizona's general economy. (3) Provide high-quality educational opportunities to students, engage in productive research in support of humanity in general and the citizens of the state of Arizona in particular, and provide public service in support of the aims and objectives of Arizona's citizens. (4) Expand higher education in Arizona through cooperation between the university system and the community college system.

The memorandum also included assumptions about growth and an extensive list of short- and long-term strategies that might be implemented to manage enrollment growth. Following the release of the document, the Strategic Planning Committee chair and I met individually with each member of the board and with each university president to review the principles, assumptions, strategies, and constraints enumerated in the memorandum. The memorandum became, in effect, the foundation on which we decided to build our new planning paradigm.

The paradigm was framed within the context of the system's strategic plan for enrollment growth. Stated simply, the plan is to enable the Arizona public universities to meet the baccalaureate and graduate student educational needs of Arizona through the next twenty years. It consists of four objectives: (1) to estimate the enrollment demand to the year 2010, (2) to estimate the optimum enrollment capacity at our existing university campuses and strategies for meeting this capacity, (3) to develop system strategies for meeting potential enrollment demands, and (4) to evaluate the resource needs and potential sources of funds of the various strategies.

The board of regents formally adopted the five-year strategic plan for the Arizona University System in September 1990. The board restated its commitment to providing access to higher education to all residents of Arizona who meet the admissions standards. Additionally, the continued admission of qualified, nonresident students to the three universities was encouraged since these students benefit Arizona residents by creating academic, social, and cultural diversity and provide important economic support to the university system and to the general economy of the state. The

board also established the principle of expansion of higher education in Arizona through cooperation between the public university system and the public community college system. Finally, in addition to this strategic direction—planning for enrollment growth—the plan includes five other system strategic directions: undergraduate education, graduate education and research, economic development and public service, diversity, and acquisition and utilization of resources.

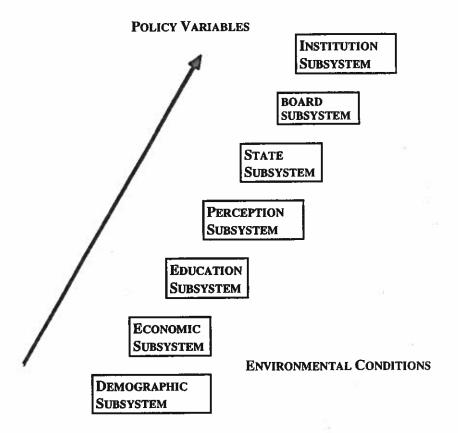
Enrollment Demand Model. The unique aspect of the planning paradigm is the development of a new enrollment demand model. The model has been built using the system dynamics approach with the intent of producing a powerful new way to look at higher education policy options. System dynamics is a computer simulation modeling approach that permits examination of the interactions among complex social systems. Central to the approach is the concept of feedback.

In the past, decision makers have been plagued by the unintended consequences of their actions. The system dynamics model enables decision makers to take a broader view of their policy options and to develop a keener understanding of the probable outcomes of their choices—in this case, the effect on enrollment demand. For example, most state enrollment projection models are driven primarily by in-state demographic trends, yet close to four-fifths of the population growth of Arizona comes from net immigration. Consequently, the model must be able to encompass more complex interrelationships between demographic and economic trends at the state, regional, and national levels.

At the outset, we made a specific distinction between potential demand and expected demand. Conceptually, potential demand exists among qualified people able to benefit from a college education if barriers to their enrollment are removed (such as lack of academic preparation or inability to pay for college). Expected demand is the most likely projection of enrollment demand considering both the removal of existing barriers and the potential creation of new barriers. It is the demand that we project will be placed on higher education in Arizona during the planning period. We intend to use the model to examine the Arizona enrollment demand implications of changes in policy at the national, state, and institutional levels and the resulting shifts in students from potential demand to actual enrollment.

In building the model, the first step was to take a broad view of a continuum of factors affecting or driving the demand for higher education (see Figure 4.1). The seven groups of factors identified fell into three categories. The first category includes factors over which Arizonans have very little control, such as demographic, economic, and political trends. The second category includes intermediate factors that Arizona institutions do not control but may influence. These include student perceptions of accessibility to college, which in turn may affect student motivation and prepa-

Figure 4.1. Continuum of Factors
Affecting the Demand for Higher Education



ration for college-level work. The third category includes factors over which Arizonans generally have more control, including state-level education funding policies; board-level policies such as tuition, residence requirements, and minority recruitment; and, finally, institution-level policies, such as admissions standards, student aid policies, and graduation criteria. Each of the seven major groups of factors influencing demand for college was incorporated into a separate subsystem in the model.

The second step in building the model was to talk with participants from the Arizona universities in order to identify measurable variables of the factors driving demand for college education, and then to specify the relationships among them. Here we looked at the effect that one variable driving demand has on another variable that also drives demand. In a positive relationship, both variables move in the same direction. For example, an increase in student grants increases the demand for college. In a

negative relationship, the variables move in opposite directions. For example, increases in the wages earned in jobs that do not require a college education decrease the demand for college. In developing the model, particular attention was paid to the effects of economic recessions on higher education enrollments. The model was programmed to consider the historical impact of recessions that have increased enrollments, under the assumption that there would be two recessions during the twenty-year planning period.

The third step was a substantial data collection effort. Much of the data used in building the model come from standard compilations that the Arizona universities generate on a routine basis. The universities also ran special computer programs to generate data used to calculate college-going rates detailed by age and ethnicity, a central component of the model. Environmental trend data, including the 1990 census, were collected from state and national agencies. These data were analyzed extensively to provide additional insights into the factors that are likely to affect future demand for higher education in Arizona.

Analytically, it was necessary to begin by measuring current enrollment by race, ethnicity, and age and to anchor the figures in a baseline year. We chose 1990 as the base year because we could anchor all our demographic data to the new national census data. Application of the college-going rates of Arizona resident students by race and ethnicity to the age and race population groups developed from the 1990 census data provides one measure of projected enrollment for college education in Arizona, assuming no change in participation rates by race, ethnicity, age, or residence status. The next step was to determine the most likely enrollment by estimating changes in college-going rates based on our current Arizona college-going rates and relating them to the rate of change in the national college-going rates by race and ethnicity over a fourteen-year period.

As a result of our efforts, we are projecting four-year-university sector enrollments to increase by 55,000 students by the year 2010, an increase of 57 percent. The enrollment increases will be distributed as 79 percent coming from residents and 21 percent from nonresidents. Total post-secondary enrollments are projected to increase 146,000 by 2010, a 58 percent increase.

There appear to be three principal reasons for these high projections. First, the population projections by the universities' planners and the official Arizona State population projections are consistent in projecting average state population growth of 2 to 3 percent per year for the twenty-year period. The continuation of existing participation rates with the projected increases in population results in large increases in expected demand. Second, Arizona has a relatively young population, which will affect the traditional college-age eighteen- to twenty-four-year-old cohort during the planning period and further increase enrollments. Third, Arizona will see significant

increases in enrollments as a result of large, traditionally underrepresented minorities moving toward majorities.

Optimum Enrollment Capacity. Each public university completed a capacity study to determine the optimum headcount enrollment capacity of its main campus, the second component of the paradigm. The studies examined the histories and cultures of the institutions, their mission statements and visions, key enrollment trends in the past decade, faculty and student opinions, proposed future enrollment profiles, and inventories of current and required space needs based on the institutions' five-year capital improvement plans and the guidelines of the Council for Educational Facility Planners International. On the basis of these studies, the three university presidents recommended that enrollments on the main campus sites be downsized at Arizona State University from 41,000 students to 39,000 students, that enrollments remain at the current 35,000 students at the University of Arizona, and that Northern Arizona University grow by another 1,500 students from 14,500 to 16,000. The enrollment capacity studies were viewed as a cornerstone of the paradigm because the mathematics of enrollment growth is simple: Enrollment demand minus capacity equals unmet need.

Strategies to Meet Enrollment Demand. The projections for enrollment growth, which is the third component of the paradigm, set the stage for the range of alternatives presently being considered. The alternatives were developed by a working group consisting of representatives from the three universities and the Board of Regents Central Office. Members of the working group included a vice president for student affairs, chief university planning officers, institutional research officers, and faculty from higher education programs within the colleges of education. The working group prepared the alternatives for review by the presidents of the three universities and the executive director of the board of regents sitting as the Council of Presidents. The alternatives were then presented to the board of regents.

These alternatives can be categorized into three groups: internal, noncapital-intensive; external, non-capital-intensive; and external, capitalintensive. In categorizing the alternatives in this way, we are attempting to look at a continuum of ways in which we might accommodate additional growth, beginning with our existing campuses' physical plants, moving to academic and physical alternatives exclusive of our campuses, and ending with construction of new campuses.

Internal, Non-Capital-Intensive. In the category of internal, non-capitalintensive strategies, we are examining alternatives such as evening and weekend colleges, a trimester system, increased financial assistance to accelerate student progress toward degrees, increased faculty workload effort, differentiated admissions standards, and increased classroom utilization.

Two general themes are inherent to these alternatives. The first is, Should we and can we make better utilization of our existing physical plants? The second is, Should we and can we modify the demand for utilizing our existing campuses? There are clearly implications for the roles and missions of our existing campuses, given our traditional views of access and our perceptions of quality. To the extent that we move toward better utilization of our existing campuses, we run into conflict with our capacity studies that recommend capping or downsizing our three existing campuses in order to preserve quality. To the extent that we differentiate admissions. we conflict with our traditional values in Arizona that hold that an academically qualified resident student should be permitted to attend any of the three universities that she or he chooses.

External, Non-Capital-Intensive. In the category of external, non-capitalintensive strategies, we are examining alternatives such as enhanced educational opportunities for Arizona residents to attend institutions in other states through expanded participation in the exchange programs sponsored by the Western Interstate Commission for Higher Education (WICHE). In the WICHE student exchange programs, western states agree to accept students in designated graduate and undergraduate programs in exchange for the right to send students to programs designated by other states. We also are examining enhanced opportunities for Arizona residents through direct contracts with governing boards of other four-year institutions in other states that have excess capacity. Encouragement of support for independent education by providing state-supported student aid to Arizona residents attending independent institutions in Arizona is a third alternative being examined. Also under consideration is shared university facilities funded by local communities. In addition, expanded corporate education similar to Motorola University, a corporate-sponsored program with curriculum and faculty provided by the local community colleges, is being considered. And, finally, we are looking at possibilities for expanding opportunities at community colleges, similar to our Northern Arizona University-Yuma/Arizona Western College (community college) model. This alternative calls for the development of a consortia campus system that would be composed of a series of university centers or branch campuses located on or adjacent to the campuses of community colleges across Arizona. While retaining their individual-institutional identities, management systems, and governance structures, the universities and the community colleges would form a system of educational consortia by means of intergovernmental agreements, mission statements, articulation agreements, transfer contracts, and telecommunications linkages through which baccalaureate degree programs on a 2 + 2 basis might be offered.

Obviously, the external, non-capital-intensive alternatives all focus on avoiding or shifting the cost of additional capital facilities by contracting with other states, by encouraging local communities to determine their needs and invite universities to offer programs in community-provided facilities, by cooperating with businesses, and by sharing existing facilities with community colleges. These alternatives seem to fall between our traditional notions of continuing education and branch campuses.

External, Capital-Intensive. The third category of strategies being considered is composed of external, capital-intensive alternatives. In this category, we are considering four alternatives: (1) a new liberal arts campus of five thousand students, (2) a branch campus or campuses of five thousand to ten thousand students, (3) a comprehensive baccalaureate and master's degree granting state college of five thousand to ten thousand students, and (4) a comprehensive, limited doctorate-granting university of ten thousand students. The liberal arts campus consideration derives from public concerns regarding the condition of undergraduate education as expressed in a number of major national reports issued during the 1980s and in the board of regents' own strategic direction on undergraduate education. The branch campus concept is a continuation of a direction already initiated in Arizona with the development of the Arizona State University-West Campus as an upper-division and graduate campus of Arizona State University. A comprehensive state college would offer an alternative currently not available in Arizona. It would focus on excellence in teaching, strong student services, and public service, and it would encourage student participation in all areas of campus life. In all three alternatives, we are considering governance structures in which the chief executive officer of the new campus would report to the president of an existing university. In the liberal arts and the state college alternatives, we also are considering free-standing campuses, with the chief executive officer reporting directly to the board of regents, as well as the possibility of separate governing boards for new campuses.

The comprehensive, limited doctorate-granting university would continue the public sector tradition of offering only university-level post-secondary education in Arizona, with a primary emphasis on undergraduate education, smaller class sizes, and limited research. The doctoral programs would evolve over time, growing from the strength of academic programs at the undergraduate and master's levels. The only governance structure contemplated under this alternative is for the chief executive officer to report directly to the board of regents.

Clearly, expansion of campuses has implications for the roles and missions of our existing campuses as we contemplate expanding the size of the public four-year sector. In Arizona, we have taken pride in the simplicity of our governance system—three separate and distinct universities reporting to one governing board. Implementation of these strategies would begin a process of developing university systems within a system or of creating multiple governing boards for the public four-year sector. If the new institutions are created within the governance structure of the existing universities, governance of those universities would become more complex. If the new institutions are created under separate boards, the opportunity for competitiveness among institutions reporting to separate boards is enhanced. In either case, our existing universities will be affected.

Policy Choices and Social Consequences. We have examined the social consequences of a number of our policy choices, including the effects of closing the participation rate gap between majority and ethnic minority students, increasing the transfer rate from community colleges to the universities, increasing the graduation rates of high school students, and limiting enrollments. Through the use of our model, we have been able to examine the consequences of modifying existing policies or barriers to enrollments and their implications to our expected enrollment demand increase of 55,000 students by the year 2010. We are using "what if" analysis to examine both the impacts of outcomes that we would like to achieve and the harmful influences that we would like to mitigate. The ultimate outcome that we seek is development of a plan to implement one or more of our strategies.

Closing the Participation Rate Gap. Perhaps one of the most important findings to come from the new paradigm has been the implications of the potential effects of the shifts in race, ethnicity, and age in the population projections on enrollment demand. We examined the implications of policies designed not only to encourage minority participation in postsecondary education but also to close the gap between majority and minority participation rates. Currently, there are 40,000 minority students participating in postsecondary education in Arizona. By the year 2010, the projected demand will increase the number of minority students by 75,000 to a total of 115,000 due to population growth and the change in ethnic distribution of the population. Closure of the current gap in participation rates by 50 percent will increase demand by an additional 23,000 students by the year 2010; elimination of the gap will increase demand by 46,000 students over the expected minority student base of 115,000. Hence, the elimination of barriers to participation in higher education may increase minority enrollment demand by 20 to 40 percent. In summary, we have found that for Arizona, future enrollment demand depends more on race, ethnicity, age distribution, and rates of participation than simply on the highs and lows of our total state population projections.

Increasing Community College Transfer Rates. There is a significant relationship between the community college and university sectors in Arizona. Many of the community colleges have registration processes that permit a student to jointly register at a community college and a university. The relationship has been further enhanced by the development of an articulation agreement between the community colleges and the universities that is based on a course equivalence guide. A student can register for a course at a community college and know at the time of registration whether it is transferable to the universities.

Because it is easy for students to cross-register, and even to transfer from the community college to a university, back again to a community college, and then back again to a university, estimates of the number of students who transfer from community colleges to the universities are not precise. This phenomenon of cross-registration and transferring has become known as "swirling." It has resulted in the universities having to rely heavily on the community college system to provide the lower-division coursework for many of our students. Swirling makes the task of estimating the number of annual transfers from the community college sector difficult. However, our estimates are that five thousand students per year transfer from the community college sector to the three universities. If the numbers were doubled, and if these students persisted at the universities, the additional demand would result in an almost 16 percent increase to our baseline projection of fifty-five thousand additional students between the years 1990 and 2010.

Increasing High School Graduation Rates. Arizona currently graduates 64 percent of its high school students. If present efforts such as the Governor's Task Force on Education Reform are successful and result in an increase of the graduation rate to at least the national average of 74 percent, higher education enrollments will increase by three thousand students per year. However, when the pooling effect of these students is considered over the lifetime of their postsecondary experiences, enrollment demand is estimated to increase in excess of ten thousand students.

Enrollment Caps. The numerous effects of enrollment caps are both positive and negative. Caps would most likely result in a change of the apportionment of the resident-nonresident mix, necessarily increasing admissions standards and improving educational program quality and prestige. Implicit in the improved education program quality and prestige is an assumption that we would experience improved graduation rates. Enrollment caps also may result in reduced dropout rates.

On the negative side, enrollment caps may result in fewer minority students in the universities, unless the caps are accompanied by significant efforts to strengthen preparation for university-level work and enhanced recruitment and retention programs. Caps also might have a negative effect on the Arizona economy. With fewer residents prepared for higher-value jobs, the state will experience slower economic growth. The consequences for the state would be a smaller tax base, less capacity to deliver services, and smaller gains in quality of life compared to the rest of the nation.

Conclusion

Traditional methods of estimating future enrollments have not been successful. Frances (1989) has documented and explained many of the reasons for the failure of past demographic modeling efforts and has suggested the need to consider other trends, including changes in education and student aid policies, changes in economic, social, and political trends, and changes in individual institutional management strategies (Frances, 1990).

Ultimately, our success at planning for enrollment growth will be judged by the convergence of the services that we end up providing with the demand for those services. It is one thing to anticipate demand, another to plan for demand, and a third to meet demand. A new planning paradigm that considers these elements within the broadest framework of strategic planning will bring about the kind of policy analysis and implementation that will permit higher education to be more cognizant of the social consequences of its policy initiatives. Arizona has begun implementing such a paradigm. Our success or failure will not only define the prospects for the vitality and relevance of Arizona's public university system for the next half century but may well also define the social and economic fabric of the state.

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