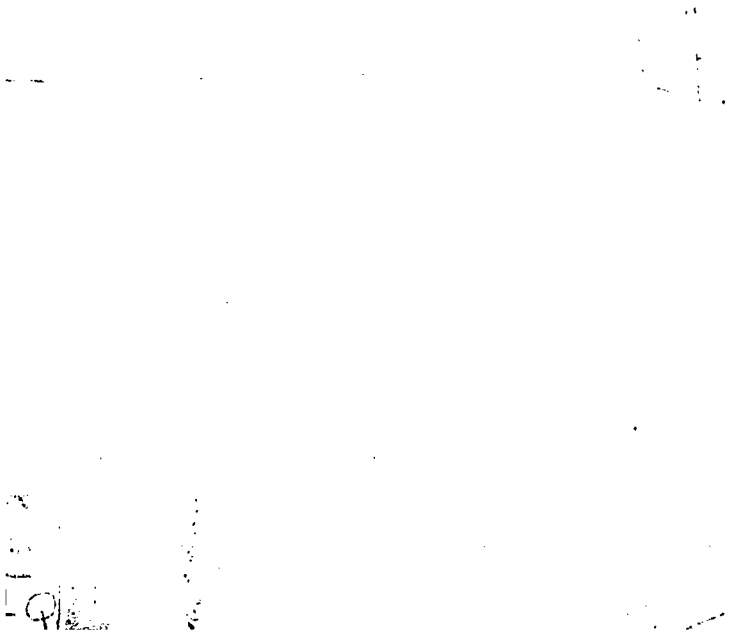

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ABSTRACT

Policy-impact analysis is introduced as a model to aid higher education in dealing with the significant problems in the decade of the 1980s. The model provides a framework within which a variety of futures research techniques are tied to policy development, implementation, and evaluation. The utility of the model is that it structures communication between those developing information about the future and those responsible for policy formulation and decision-making in such a fashion that policy-makers can choose among alternative policies based upon the probable impact of each. There are four stages in the policy impact model: monitoring, forecasting, goal setting, and policy analysis and implementation. Monitoring and forecasting perform the role of organizing, structuring, and articulating images of the future with respect to a particular set of assumptions and indicators. The next stage of the model, goal setting, revolves around the process of setting realistic goals given the information provided in the first two stages. This stage requires the generation of a desirable future in a procedure much like that of forecasting using the delphi method. The first three stages serve to identify specific trends, the events which may affect those trends, and the goals of the organization. In the final stage, the research staff estimates how a particular policy may affect a given trend through influencing the probability of the occurrence of one or more specified events affecting the trend. When the selected policies are implemented, the process of monitoring begins anew, thereby enabling the staff to evaluate the effectiveness of the policies by comparing actual impacts with those forecasted. (SW)

Policy-Impact Analysis: A Rational Method to Respond to the Challenges Faced by Higher Education in the Eighties

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Paper prepared for presentation at the Florida State University Institute for Studies in Higher Education Distinguished Professor Series

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Policy-Impact Analysis: A Rational Method to Respond to the Challenges Facing Higher Education in the Eighties

There are a number of significant problems facing higher education in the decade of the eighties. Financial support for the enterprise is, perhaps, the most pressing problem. For example, at present inflationary losses are averaging fourteen percent per year, with revenues growing at only seven percent per year a fact which, if continued through the decade, will leave colleges and universities with one-half the revenues (in real terms) they now have (Dede, 1981). Furthermore, given current economic difficulties of the country as a whole, education, and particularly higher education, has no strong claim to extra funding by federal or state governments. Indeed, there is increasing evidence of an attempt to curtail government spending, or where there is increased spending, it appears that it will be for strengthening our national defense not education. Too, given the declining percentage of parents with college age children, the increased aging of the American population, and the fact that discretionary income for U.S. households has declined markedly since 1972, the public's ability to support higher education (contributions, taxes, and increased tuition) has also declined.

Such financial problems are compounded when one examines demographic projections of the normal college-going age cohort. For example, it is estimated that the cohort of 18-24 year olds in this country will decline some 15% (or 2.6 million) during this decade (Johansen and McNaulty, 1977). This decline undoubtedly will affect enrollment in higher education since

forty-eight percent of the total enrollment (and 64% of the undergraduate enrollment) came from this age cohort in 1975. Given the projected decline in financial aid available to students, one could anticipate further reductions in enrollment. Such problems are attentuated by a growing perception in our society that a college degree no longer has the value it once had, i.e., that individuals with vocational and technical training can obtain better paying jobs than people with baccalaureate or professional degrees. This perception is enhanced by the fact that "underemployment" is increasing, i.e., the proportion of female college graduates who have settled for non-professional employment has increased four-fold, and the proportion of men, three-fold, during the last 15 years. Indeed, the U.S. Bureau of Labor Statistics projects a "surplus" of college graduates reaching 140,000 annually by 1985 (Dede, 1981).

Many of these problems have been present in higher education during the 70's, as noted in much of the literature of the field which focused on maintaining a "steady state." The 70's saw another phenomenon related to the state of the economy, that is, the decline of faculty mobility in the academic marketplace. This decline has led into a concomitant problem in the 80's, i.e., the "tenuring-in" of college faculties. Consequently, it is difficult to introduce "new blood" in the form of energetic, highly trained, young doctorates of all races, sexes, and creeds. Thus there is concern of academic stagnation on many of our campuses, and a good deal of agitation with respect to the problem of under-representation of women and minorities on college and university faculties.

Along with the projected decline of enrollments of traditionally-aged college youth, is an accompanying change in the composition of the college student population, in that there are increasing numbers of over-35 year old adults, minorities, women. This changing mix of the student population with accompanying demands for innovative pedagogical strategies as well as for changing the curriculum, and even changing the time at which curriculum is offered (evenings and weekends), will in turn create additional administrative problems on college campuses.

In sum, then, the decade of the 80's promises to be one of challenge and uncertainty for the country as a whole, and for higher education in particular. The challenge of the 80's will be to develop policies to cope with the problems, some of which are outlined above, and still maintain quality education, and education of the type which the citizens of this country need in order to meet the demands of a complex, increasingly technological, and somewhat unstable world.

The purpose of this paper is to introduce a model for developing and assessing policies in the face of these challenges. This model, the policy-impact analysis model, provides a framework within which a variety of futures research techniques can be tied to policy development, implementation, and evaluation. The utility of the model is that it structures communication between those developing information about the future and those responsible for policy formulation and decision-making in such a fashion that policy-makers can choose among alternative policies based upon the probable impact of each.

Policy-Impact Analysis Model

There are four stages in the policy-impact analysis model: monitoring, forecasting, goal setting, and policy analysis & implementation. Monitoring refers to the identification and selection of areas of concern either to policy makers or scholars. For instance, if entering freshmen enrollments in liberal arts programs appear to be declining, university officials may choose to focus on this issue as appropriate for study and possible action. The second stage of the model, forecasting, involves using a variety of futures research techniques to forecast the probable future for selected issues, now specified as indicators (or variables), e.g., liberal arts enrollments. In response to the projected trends of indicators in these areas policy makers then establish goals, the third stage of the model. For example, using the futures research techniques described below, it is projected that liberal arts programs will experience decreasing enrollments. State system level university officials, upon receiving this information, may then act to establish goals for increasing (or maintaining) enrollments in liberal arts programs. This leads to the fourth stage of the model, the analysis and implementation of policies to achieve those ends. In this stage, a variety of possible policies are analyzed in order to determine their probable impact, and are ranked on those characteristics deemed important, e.g., relative costs versus benefits. Those policies ranked at the top are then implemented. Evaluation occurs when the stages of the model are repeated using additional analyses

and further refinements. This model will be described and illustrated in more detail below.

Stage I: Monitoring

Monitoring consists of first identifying areas for study then, in conjunction with decision-makers, selecting appropriate indicators of these issues of concern, and, finally using a data base of educational/social indicators, developing and plotting historical data measuring those indicators. There are components in this process. Primary among these is the availability of an adequate data base which enables the research staff to measure indicators over time. This means that in order for the staff to illustrate trends from these data in, for example five year time increments, data must be available for at least the last 5-10 years. For example, if the staff wishes to forecast the trend in student enrollment for the next five years, enrollment data over the past 5-10 years must be available. Furthermore, the staff must ascertain that these data are of reasonable reliability and validity.

Stage II: Forecasting

There are a variety of forecasting methods, ranging from "implicit" forecasts of the trends discussed in stage one, to "explicit" forecasting involving mathematical trend extrapolation, judgmental trend extrapolation, and probabilistic extrapolation.[2]

Implicit forecasting is the oldest forecasting technique, and simply involves viewing the historical data to ascertain the trend, (e.g., enrollment rates since World War II using

five year increments). This method of forecasting assumes that those forces shaping recent developments of the trend, irrespective of what they are and how they operate, will continue to affect the trend in the same fashion in the future. Although this assumption is often valid, particularly for those trends which have a long and stable history, and which may not be subject to sudden changes, we know that in many instances this assumption does not hold, particularly in our rapidly changing, complex society.

Explicit forecasting refers to trend extrapolation, i.e., an extension of the recent course of developments with respect to a particular trend. There are two basic techniques in this method, mathematical and judgmental. Mathematical methods range from algebraic equations developed through regression analyses to more complex systems models. Such methods enable one to mathematically develop a "fit" with historical data and then extrapolate the trend line into the future to generate the forecast.

The judgmental method of explicit forecasting uses expert forecasting and/or the delphi technique. Expert forecasting is accomplished by requesting experts in the field to forecast a trend based upon the data base and upon their best estimates of changes in the likely future. The delphi technique is a method whereby the combined forecasts of a group of experts are used in an attempt to describe the future relevant to that trend. This combined forecast is then presented to the same or another group of experts for refinement and additional considerations.[3]

A major assumption of both implicit and explicit forecasting methods is that those forces which have shaped the historical development of a trend will continue to guide developments of this trend in the future. These methods tend to ignore "surprise" developments which will affect the trend.

Probabilistic forecasting, on the other hand, combines mathematical and judgmental methods, and includes "surprise" events which might occur in the future and, therefore, affect the trend. This technique requires first the development of an extrapolative forecast of a trend, then the identification of surprise events which could affect the trend, a concurrent judgmental evaluation of the impacts of these events on the trend, and, finally, through use of the computer and Monte Carlo or similar routines, calculating the probabilistic forecast of that trend.[4]

Stage III: Goal Setting

The first two stages of a policy-impact analysis model, monitoring and forecasting, perform the role of organizing, structuring, and articulating images of the future with respect to a particular set of assumptions and indicators. The next stage of the model, goal setting, revolves around the process of setting realistic goals given the information provided in the first two stages of the model. This stage requires the generation of a "desirable" future in a procedure much like that of forecasting using the delphi method. This process may involve educational experts, as well as authorities from business, industry, public interest groups, and government. The rationale for this stage is based upon the importance of having a concept of

the desirable future with respect to a particular issue in order to develop policies designed to achieve this future.

Stage IV: Policy Analysis and Implementation

The first three stages of this model serve to identify specific trends, the events which may affect those trends, and the goals of the organization. As such, these steps specify policy options and responses. In the final stage the research staff estimates how a particular policy may impact a given trend through influencing the probability of the occurrence of one or more specified events affecting the trend.

To briefly illustrate, suppose that the policy issue being studied is enrollment in liberal arts baccalaureate programs, and that measurements of those enrollments have been made since 1945 and are part of the data base available to a research study team. Furthermore, assume that those enrollments were forecast to decrease over the next 10 years, although the desired future would be one in which they would remain the same or increase. In this stage of the model the team would first identify those events which could affect enrollments adversely, e.g., inflation, the decrease in the size of the traditional-age cohort, curtailed federally funded financial aid, decreased federal and private financial support, and an increasing social perception that vocational-technical training is of more value than liberal arts education with a corresponding decline in the value of a liberal arts degree. The team would also identify events which could positively affect enrollments, e.g., an increasing tendency for mid-career shifts due to a rapidly changing technological

society in which opportunities for new occupational careers become available at a much more rapid rate than before, or the increasing tendency for major corporations to sponsor continuing professional education programs for their employees. Such events may positively affect enrollments because a widely held assumption of liberal arts education is that it facilitates the development of thinking and communication skills easily translatable to a wide variety of occupational skill requirements.

The next step in this process would be to identify possible policies which could affect those events (or which could affect enrollments directly).[5] For example, policies could be designed to increase enrollments by aggressively pursuing marketing strategies which laud the value of a liberal arts education as essential preparation for later occupational training. This strategy could be undertaken with secondary school counselors and students, as well as with first and second year undergraduates and their advisors. Too, graduate and professional school faculty could be encouraged to consider adopting and publically announcing admissions policies which grant preferential consideration to liberal arts graduates. Another policy could be to form coalition with higher education organizations in other geopolitical areas to press for increase federal aid to students as well as to institutions. With respect to the potential market in the business, industrial, and civil service spheres, policies with respect to establishing joint programs to provide liberal arts education on a part-time or "special" semester basis could be designed and implemented.

Policies could also be designed to maintain enrollments within the current student population. For example, one policy could concern an "early warning" system to identify students who may be just entering academic difficulty. Others could be designed to inhibit attrition through improving the quality of the educational environment. Such policies would involve establishing faculty and instructional development programs, improving student personnel services, etc.

Of course, implementation of specific policies can affect the probabilities of events, i.e., they can make them more or less likely to occur. Too, events can interact with each other to affect specific trends. Consequently, a policy might affect several events, thereby changing the probabilities of their impacts on each other and on the trend of concern, undergraduate liberal arts enrollment. Such interactions between policies and events may be categorized in a policy-to-events impact matrix, a matrix which enables the staff to generate new estimates of the probabilities and impacts of those events modified by the policies. These estimates are calculated on the basis of multiple conditional probabilities in the computer routines cited earlier in the discussion of probabilistic forecasting. The end result of this somewhat complex activity is a policy-impacted forecast for undergraduate baccalaureate programs given the implementation of specific policies designed to improve enrollments directly, or indirectly by impacting on those events which in turn affect enrollments. Thus competing policy options may be evaluated by identifying those policies with the most favorable cost-benefit ratio, those having the most desirable effect,

the most acceptable trade-offs, etc.

Discussion

Evaluation occurs when the policy-impact analysis model is iterated. That is, when the selected policies are implemented, the process of monitoring begins anew, thereby enabling the staff to evaluate the effectiveness of the policies by comparing actual impacts with those forecasted. This requires that a data base of social/educational indicators be up-dated and maintained in order to evaluate the forecasts and policies and to add new trends as they are identified as being important in improving education in the future. Implementation of this model also requires that new and old events be re-evaluated, and that probabilistic forecasts be up-dated in order to enable goals to be refined and re-evaluated. This activity leads to the development of new or re-evaluated old policies, which in turn, enables the staff to up-date policy-impacted forecasts.

It should be noted that the futures research techniques described here, particularly the probabilistic forecasting methods, have been developed only within the last decade or so, and have been used primarily in business and industry, with mixed results. The efficacy of these techniques is dependent upon the ability of the staff to (1) identify those events which may affect a trend directly or indirectly, (2) accurately assign subjective probabilities to those events, and (3) design and obtain a reliable and valid data base of social/educational indicators. The efficacy of the policy-impact analysis model is dependent

upon the close interaction of the staff and decision-makers within each stage of the model.

However, given these requirements, conditions, and limitations, the model uses the most advanced technology available in contemporary social science in a rational approach to provide policy makers more reliable information about possible futures, and how to use that information to achieve a more desirable future. Given the challenges facing higher education in the eighties, scholars and policy-makers in the higher education community are well advised to explore this approach to formulating and implementing policy at the institutional, state, and regional levels.

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Footnotes

[1]This presentation is based upon recent articles by Renfro (1980) and Morrison (forthcoming). For a reprint of the Renfro article, write Dr. William L. Renfro, President, Policy Analysis Co., Inc., 148 E Street, S.E., Washington, D.C. 20003. For a copy of the proceedings which contains the Morrison article, write Dr. Bernice Willis, Southeastern Regional Council for Educational Improvement, PO Box 12746, Research Triangle Park, NC, 27709.

[2]For a detailed description of various forecasting techniques see Allen (1978), Alter (1979), Amara (1972), Armstrong (1978), Enzer (1976), Ewing (1979), Fowles (1976), Gordon and Stover (1976), Lipinski and Tydeman (1979), and Martino (1972).

[3]For a detailed description of the delphi technique, see Linstone and Turoff (1975).

[4]One should note that Monte Carlo routines tend to require large computers and many computer runs, and, therefore, are somewhat expensive to use. Several agencies have developed computer programs which approximate the Monte Carlo method and are more efficient. For example, the Futures Group (76 Eastern Boulevard, Glastonbury, Connecticut 06033) has developed a computer software package for trend-impact analysis (FUTURESCAN), and the Center for Futures Research, Graduate School of Business Administration, at University of Southern California (Los Angeles, California 90007) has developed a software package for cross-

impact analysis (INTERAX). Both packages enable the user to engage in probabilistic forecasting.

[5]Of course, there are events over which educational decision-makers have absolutely no control, e.g., inflation and the size of the traditional-age cohort.