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AUTHOR Humphrey, David A.
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ABSTRACT

Higher education today is the target of growing pressure for improved management procedures. As one response to these societal pressures, higher education has developed numerous nontraditional patterns of instruction. The purpose of this paper is to discusss educational and instructional development, that is, change within higher education, and the evaluation thereof, that is educational and instructional cost analysis and quality measures as they currently exist and operate in higher education, and to emphasize particularly how they apply to individual courses of instruction. This discussion attempts to identify flaws, problems, or difficulties in this area and to illustrate some identified barriers in the cost analysis of nontraditional instructional programs. The problem areas which have been identified result from present techniques that are limited by basic assumptions, procedures, and terminology regarding the organization of instructional processes. They are, consequently, traditionally oriented and narrow in scope. (Author/PG)

INSTRUCTIONAL DEVELOPMENT:

THE PROBLEMS OF COSTS AND EFFECTIVENESS

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David A. Humphrey
Office of the Vice Chancellor for Academic Programs
State University of New York
Albany, New York

INSTRUCTIONAL DEVELOPMENT: THE PROBLEMS OF COSTS AND EFFECTIVENESS

Higher education today is the target of growing pressure for improved management procedures. Institutions of higher education are faced with fiscal constraints, and they are being forced to make more effective use of the resources at their disposal. Increasingly, restrictions and conditions are being attached to these resources. Colleges and universities are being asked to be accountable, and accountability is being interpreted in a broad context. Not only must stewardship obligations be met, but the provider of funds is demanding assurance that desirable benefits result from resources invested. Simultaneously, demands for accountability are being exercised by a new breed of student desiring a greater variety of learning options.

As one response to these societal pressures, higher education has developed numerous non-traditional patterns of instruction. Programs and processes of instructional and educational development have been central to many of these alternatives. Some of the changes and reforms have been derived from purely philosophical bases while others have been prompted by financial considerations. Some possess characteristics of both. However, regardless of the motivation or rationale, the financial and the quality implications of educational change are being increasingly examined.

The purpose of this paper is to discuss educational and instructional development, that is, change within higher education, and the evaluation thereof, that is educational and instructional cost-analysis and quality measures as they currently exist and operate in higher education, and to emphasize particularly how they apply to individual courses of instruction. This discussion will attempt to identify flaws, problems or difficulties in this area and to illustrate some identified barriers in the cost-analysis of non-traditional instructional programs. The problem areas which have been identified result from present techniques which are limited by basic assumptions, procedures, and terminology regarding the organization of instructional processes. They are, consequently, traditionally oriented and narrow in scope.

Awareness of this is of particular significance in instruction for two reasons: first, most educational changes focus directly on the teaching-learning process and the methodologies involved; and, secondly, the instructional budgets at most institutions of higher education constitute 50 percent or more of the total budget. The scope of such expenditures is emphasized in the fact that for the fiscal year 1972-73 higher education appropriations for the fifty states totaled over $8 billion in annual operating expenses.

It is not the purpose of this paper to resolve the problems in their entirety, but rather to bring them to your attention and to suggest how variations in cost-analysis procedures, through the

collection of appropriate data, can result in more meaningful analysis, and hopefully, decision-making.

Operating in an environment of tighter cost constraints, the academic manager in higher education today is forced to make difficult decisions about the allocation of the institution's resources for instruction. Some programs may be eliminated, some may be curtailed, and few new programs are being initiated. In some cases the growth of academic programs must be balanced with changing student enrollments, and in other cases, programs may have to be combined or reorganized. These decisions must, or should be, made with a knowledge of where the funds will come from or where the savings will go.

Fiscal information about the internal operations of academic programs is more important to the effective management of higher education institutions today than it was, even five years ago.

Trends in the cost-analysis of instruction in higher education suggests two major hypothesis for this paper. First, that higher education in general, and the instructional process in particular, is changing. Secondly, that existing cost-analysis procedures are intimately tied to the budgetary organizational structures employed by colleges and universities. The underlying theory indicates that the two hypothesis are not naturally compatible.

Therefore, if the current instructional cost-analysis techniques are inadequate to provide a cost picture of the

traditional course of instruction, they are of even less value in providing a cost-analysis of non-traditional patterns of instruction.

The analysis of costs associated with higher education has been a desirable goal for the past one hundred years, and has been a practice of institutions to a greater or lesser extent, for at least the past forty years.

One of the major factors associated with the analysis of costs is that it has been undertaken largely by those closest to the information, that is, financial managers and budget officers of the institutions involved. This is not to say that the data generated is incorrect, or faulty in what it offers. We have all found it informative, interesting, helpful and often even supportive. One observation I have made, however, is that administrators, faculty, students, board members, foundation officers, and even legislators, who all employ statistics generated in one way or another, become confused, lost, or even uninterested once the information proceeds beyond basic, somewhat familiar data, such as cost per student, average faculty support, student-faculty ratios, etc.

It strikes me that there exist two major difficulties here, both of which are inherent in nature of the analysis conducted. One difficulty is the lack, on the part of academic administrators, of a good comprehensive understanding of the financial and budgetary

structures employed by higher education, particularly as concerns the details and innerworkings of the system.

A second factor, which I would like to remedy immediately, is the uncertaintity and possible confusion which eminates from the terminology associated with cost-analysis.

Today, we are surrounded by terms such as cost-benefit-analysis, cost-efficiency-analysis, and cost-effectiveness-analysis. A brief explanation of each may prove helpful.

A cost-benefit-analysis is a means for assembling the resources, that is, the costs, which are proposed for use within a specific activity, and comparing them with the anticipated or expected results, that is, the benefits, which are likely to be obtained from that activity.

This type of analysis is undertaken on a very broad, general basis, and may be referred to as "societal cost-analysis." The concern, naturally focuses on resources, or costs, but asks such questions as "Is it better, or more beneficial to society, for us to engage in energy research or cancer research" or "Should we establish an institute for government analysis or improve the student-faculty ratio?" or "Should the university initiate a new undergraduate major in anthropology or should we expand graduate biology to a doctoral program?

Cost-efficiency, the second term which is often used today, is the measurement of resources, or costs, involved in the particular methodology or set of methodologies available in goal or objective

accomplishment. In other words, with a direct concern for the costs or resources involved, the central question is "Are there alternative methodologies available to us in the performance of a particular task, and if so, what does each cost?"

Considering the sets of cost-benefit inquiries posed, we can suggest that cost-efficiency questions would be sub-categories therein. For example, if we look at the establishment of an anthropology major versus a biology doctorate we might look at alternative strategies for each and study their costs. Or we might analyze the costs of various types of research methodologies available for either energy or cancer research.

It may also be determined that an assist by outside funds would, of course, be of importance, and reduce the institutional commitment.

The third type of analysis mentioned, that of cost-effectiveness, is suggested as being the measurement of resources, that is, the costs allocated to a specific project, activity, or objective. Comparatives are possible when, in concert with an analysis of the results which are generally affixed to quality standards, different methodologies are available for analysis in terms of the alternative courses of action possible.

Briefly stated, cost-effectiveness analysis involves the comparison of the resources required, that is, the cost for, and output of, feasible alternative strategies employable in the achievement of program objectives. In essence cost-effectiveness

asks, "What is the cost involved in doing what we are doing, and how effective is the job we are performing?"

Suppose the question were raised regarding improvement of the student-faculty ratio. Can it be improved? Are there techniques available outside of increasing the number of faculty members? What if we change the methodology of instruction? What are the costs involved in any of the possibilities? What would any change have on existing programs or on a new anthropology curriculum? How are the faculty being used now? How will they be used tomorrow?

Efficiency and effectiveness relate to each other over the long run. Efficiency is the relationship of input to output. Effectiveness, or quality, is the relationship of standards of accomplishment to output.

The questions posed are all interrelated--just as the types of cost-analysis are interrelated. One builds upon the other. One cannot have an accurate picture of cost-benefit analysis until he knows the alternative courses of action available within each of the major program areas being considered. This involves a thorough study of all possible methodologies available for goal accomplishment, with clear statements regarding the costs and effectiveness associated with each.

Higher education has a double dilemma in this regard--we have problems with both the costs and effectiveness. We have trouble analyzing traditional methodologies, but more so in analyzing proposed new or alternative patterns--particularly when it concerns instruction, especially individual courses.

The course is the basic unit of instruction in higher education. The course is the unit to which academic credits are attached. An academic program leading to a degree is made up of a student's successful completion of a set of courses, which taken together, add up to the number and type of academic credits required to receive the degree.

The cost and the quality of an individual course are important pieces of information needed to analyze the financial implications of academic programs. However, current techniques of effectiveness measurement and instructional cost-analysis in higher education do not provide adequate data for either one.

Let's consider the nature of the complication, as presented to us by the instructional process.

A non-traditional course is simply a course that does not conform with the traditional canons of college instruction.

The development of the typical conventional or traditional college course is a relatively standardized process. Designing a non-traditional course is not. Unfortunately a single good set of rules for designing a non-traditional course does not exist. Once one leaves the shelter of traditional assumptions, the options for organizing a course of instruction are limitless and there is no precise and universally acceptable formula. There are, however, a few concepts which help to reduce the complexities of the instructional design process, and identify the component parts of the instructional process so that architectural-like planning and

design may result. If one considers instructional design from the comprehensive and systematic point of view which characterizes architectural design, then it becomes necessary at the outset to define and categorize the components from which and of which the architecture of instruction will be created.

All of these instructional components fall into one of three general categories. First, are the different types of situations in which instruction takes place. Second, is the variety of ways of arranging an exchange of information among teachers and learners, and third, would be the resources necessary to facilitate the process of instruction.

Non-traditional instruction, therefore, is concerned with instructional design and the ability to manipulate and manage the countless varieties of non-traditional instructional configurations.

A course of instruction is a vehicle for helping students achieve some definite set of educational objectives.

The design of a course of instruction which follows the statement of objectives involves two major elements.

First, designing the course syllabus--which is the plan for the instructional content of the course, and, secondly, designing the course format--that is, the plan for the instructional activities of the course.

A course design, then, is a plan for the content and the activities that will be used to help students achieve the educational objectives of a particular course.

In designing a course of instruction, the instructional developer, the faculty, the academic department, and the institution, must consider two basic questions. The first question is, "How much will it cost to operate a course with this particular design?

The second question is, "How effective will this particular design be in helping students achieve the course objectives?"

If the individuals involved in instructional development could quantify the answers to these two questions, they could compare the cost-effectiveness of alternative designs for a course. This would provide data for management decision-making and allow for selection of the particular design which would make the most efficient use of the institution's resources, and be maximally effective in helping each student achieve all of the objectives of the course.

The concept of cost-effectiveness represents a relationship between two individual sets of measures--costs and effectiveness. Prior to combining them, consider each separately for a moment.

Cost is a measure of the economic value of the human, material and facility resources used to develop and operate a course, and effectiveness is a measure of how well a particular combination of resources perform in helping students achieve the educational objectives of a course.

Although cost-effectiveness is, or at least, could be, a useful concept in comparing alternative means for achieving a given end, it is difficult, maybe even presently impossible, to use this tool with any precision in comparing alternative designs for a particular course.

The difficulty, which is, of course, obvious, is first in finding an adequate way to assess the effectiveness of a proposed syllabus or format for a course, and second, in the translation of an assessment, if conducted, into some quantifiable unit of measure.

The measurement of student achievement, for instance, is not necessarily a measure of how effective the instructional content and activities of a course have been in helping students realize these achievements.

Another difficulty, one that may be somewhat less obvious, is that the instructional development team has to test a unit of instruction with students before he can make a reasonable assessment of its effectiveness. And, if he is to test a set of alternative designs for a particular unit, this can lead to a very long prototype testing program.

Therefore, in trying to compare the probable effectiveness of alternative designs for a course, the instructional developer must rely a good deal on experience, hunch, and intuition.

Although a prototype testing program can improve the confidence one would have in the effectiveness of a particular course design, there is no sure way of forecasting the effectiveness

of a syllabus, that is the content, or the format, which are the activities during the design stage of course development.

Costs, on the other hand, are a more manageable measure. Although one can calculate costs in various units, dollars are the units normally used in assessing the costs of instruction.

We can hang dollar signs on the resources we plan to use in a course with a particular design, and, as a consequence, we can generate a wide variety of cost data from the design alone, without ever putting the course into operation.

Therefore, we can forecast the instructional costs of a particular course design--and we can compare the costs of alternative designs, with reasonable accuracy, without testing these designs in an operational setting.

The Newman Report has stated that, "...it is within individual departments and educational programs that cost-effectiveness thinking will be most rewarding....because that is where the payoff is--in making it less costly for students to learn English, or political science, or electric engineering."

And, just last year the Commission on Non-Traditional Study found insufficient data to substantiate claims, pro or con, regarding the financial implications of non-traditional programs.

Newman's Task Force on Education contends that this situation has developed for two major reasons. One is that the complexities involved in cost-analysis allow for it to be done badly. Secondly, educators fear the results, primarily because it may burst

the bubble inscribed with the theory that cost and quality go hand-in-hand.

How did we get into such a situation?

In the face of a financial or accountability crisis, a college or university's options are few in number. First, it may attempt to find new resources in order to continue its ongoing programs. Second, it may cut back its programs to the level of available resources. Or, third, it may try to find new ways to make more productive use of its existing resources.

Traditionally, higher education institutions, depending upon the times, have acted upon one or the other of the first two alternatives. Rarely, if at all, have they attempted the third. The first two alternatives have been and will continue to be pursued, but neither has sufficient range of effect to provide a long-term solution to the problem because each represents a fixed relationship between inputs and outputs. Both increased resources and retrenchment affect only the total expenditures of an institution, and not the unit cost of its educational services. Increased resources provide for increased services; decreased resources prompt retrenchment of programs. The results are either more services for more cost or fewer services for less cost. In both instances the ratio of inputs to outputs remains constant.

Most cost-analysis techniques have been used to determine costs at the system, university, college, school, division or department levels, while no cost-analysis technique has been

specifically designed to measure the financial implications of a single course of instruction. In situations where the costs of instruction for individual courses have been determined, it has been accomplished through averaging or deriving percentages based on overall departmental costs. These derivative costs are often inadequate indicators of the costs to an institution in operating a particular course for a semester or academic year.

Whatever past justifications there may be for not analyzing the costs of courses in higher education, the new climate of accountability has changed the need for instructional cost data. Colleges and universities today are being pressed to produce cost-analysis data, not only to validate their budget requests to funding authorities, but also to provide academic management with financial data as input for internal decision-making.

A question one might ask is "Why are the current cost-analysis techniques in higher education so ineffective in providing a true cost picture of non-traditional patterns of instruction?" There are a couple of reasons which deserve our consideration.

In the first place, current techniques use a financial terminology that is tied to traditional patterns of instruction. The description of a non-traditional instructional pattern in these terms often falsely describes the educational process which is conducted within this pattern. And secondly, in traditional patterns of instruction, courses may vary in subject field, curricula, level of instruction, size of classes, etc., but the cost-structure of all

traditional courses, with some minor variations, are essentially the same. Current instructional cost-analysis techniques are based on the assumption that the operating costs associated with a course of instruction are almost entirely determined by the costs of faculty time used in a course. Other costs primarily those of an instructional support nature, are such a small percentage of the total costs that they can be adequately represented by allocating them to the courses as a percent of the average support costs of the department offering the course. These assumptions are about cost-structures and the types, amount and source of resources used in a course are not necessarily valid for non-traditional patterns of instruction.

Consequently, the language and the basic assumptions used in current instructional cost-analysis techniques may seriously distort the institutional costs of operating academic programs that include non-traditional patterns of instruction.

This situation presents the academic manager with a double dilemma. He cannot adequately determine the cost of individual courses of instruction within an academic program. And if the program employs non-traditional patterns of instruction, either within the conventional one semester course structure, or within some new course structure, the current techniques of cost-analysis are of little assistance in providing the data on instructional costs.

In essence, the educational process is changing. It is already significantly different than it was in 1935 when the first national comprehensive system for instructional cost-analysis was

developed. The budgetary structures of higher education have not accommodated these changes.

In conclusion it can be remembered that the 1971 Newman Report, suggested that, "The measurement of cost and performance in higher education is somehow regarded as illegitimate." To this it could be added that instructional development, with its complex procedures and processes, serves to compound this situation. A situation it did not create, but nevertheless finds itself entrapped.