

# Utilization of Efficiency Analyses in a Educational Department: Making an Informed Decision

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## ABSTRACT

The decision to utilize cost-benefit and cost-effectiveness analysis in a hospital education department may not represent the most efficient use of the department's resources. To make an informed decision requires an understanding of the potentialities and limitations of efficiency analysis and an appraisal of the decision's impact on the department. A critical examination of the pros and cons of cost-benefit and cost-effectiveness analysis is presented, followed by a suggested framework for decision-making. The weighing of the benefits and costs of efficiency analysis in terms of departmental needs and priorities allows the nurse educator to make a decision that optimizes the use of the department's resources.

Today's cost-conscious health-care environment coexists with the knowledge explosion and era of technological innovations. For the hospital-based staff development department, these trends create the problem of meeting increased educational needs of staff with fewer available human and monetary resources. Staff development departments are likely targets for budget cuts, since uninformed administrators view education as a costly liability with little or no impact on the overall organization's goals (Kelly, 1985).

Several authors have proposed the use of accounting procedures, such as cost-benefit or cost-effectiveness ana-

lyses, as one way to justify educational costs and make informed decisions regarding the expenditure of limited training dollars (del Bueno and Kelly, 1980; Hicks, 1985; Johnson, 1986; Kelly, 1985; Shipp, 1981). Cost-benefit and cost-effectiveness analyses are formal analytical techniques used to compare the positive and negative aspects of alternative uses of resources; they are logical attempts to weigh the pros and cons of a decision (Warner & Luce, 1982). However, while these accounting tools may be conceptually straightforward, their application is difficult and the results may be challenged by other persons (Hicks, 1985): Cost-benefit/cost-effectiveness analysis is not a panacea for all economic woes.

The decision to utilize cost-benefit and cost-effectiveness techniques represents a substantial investment of a department's resources. Unless the benefits to be obtained outweigh costs to the department, the decision may not represent the most efficient use of those resources. Thus, the cost-conscious nurse educator will make an informed decision concerning the utilization of cost-benefit and cost-effectiveness analysis. To make an informed decision requires an understanding of the general theory, potentialities, and limitations of cost-benefit/cost-effectiveness analysis, and a realistic appraisal of the impact that efficiency analyses will have on the department.

The purpose of this article is to critically examine the potentialities of cost-benefit and cost-effectiveness analysis to hospital education departments relative to limitations and costs. In the following sections, an overview of cost-benefit and cost-effectiveness will be presented, followed by a discussion of the potentialities and limitations associated with the accounting procedures. Finally, a framework will be suggested for making an informed decision regarding the cost-benefit/cost-effectiveness analysis in educational departments.

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### **An Overview of Cost-Benefit and Cost-Effectiveness Analysis**

The basic procedures and principles of cost-benefit and cost-effectiveness analysis derive from work completed during the 1930s to identify decision-making criteria for public investment activities (Rossi & Freeman, 1982).

In the private sector, the market functioned as a resource allocation mechanism: the absence of market forces in the public sector led to the analytical techniques of cost-benefit and cost-effectiveness analyses (Warner & Luce, 1982). These techniques have been used in water resource management, by the Department of Defense, and in social service areas, such as health care and education (Warner & Luce, 1982).

When resources are scarce, or demands for resources exceed available supply, output must be rationed (Hicks, 1985). In this instance, the preferred program for funding is one that produces the most outcomes on the most targets for a given expenditure (Rossi & Freeman, 1982). As Bootman, Rowland, & Wertheimer (1979) state, "the program with the largest present value of benefits less costs is the 'best' in terms of economic value" (p. 132).

Rossi and Freeman (1982) defined cost-benefit analysis as, "The economic efficiency of a program expressed as the relationship between costs and outcomes usually measured in monetary terms" (p. 268). In cost-benefit analysis, all costs and benefits are valued in monetary units, whereas, in cost-effectiveness analysis, program outcomes are measured in nonmonetary units (Warner & Luce, 1982). Thus, cost-effectiveness analysis determines "the efficacy of a program in achieving given intervention outcomes in relation to the program costs" (Rossi and Freeman, 1982, p. 132).

### **Potentialities of Cost-Benefit/Cost-Effectiveness Analysis**

Rossi and Freeman (1982) discussed the use of cost-benefit and cost-effectiveness techniques at two different points in program development. In the planning stages, the anticipated costs and benefits form the basis for ex-ante cost-benefit analysis. If the staff development department must choose one program to fund from several competing activities, this method allows a comparison of divergent programs to determine which program has the highest benefit per unit cost. Significant limitations of ex-ante analysis arise from the nonempirical basis of the estimated costs and benefits, and from the assumption that the program will be successful in achieving the predicted positive outcomes (Rossi & Freeman, 1982).

For educational programs, as with other human service programs, the use of ex-post cost-benefit and cost-effectiveness analysis is more appropriate for the previously mentioned reasons. This type of analysis is performed after the program is completed and is considered an extension of impact evaluation since "solid evidence of net impact is the basis for the formulation of benefits and effectiveness" (Rossi & Freeman, 1982, p. 293). This type of evaluation has as its fundamental purpose the determina-

tion of program effectiveness, or "whether a given service produced a hypothesized outcome on preselected criteria" (Schulberg & Baker, 1979, p. 11). The ex-post analytical tools provide sound data that the cost of the interventions is justified by the outcomes, if sound judgment and basic research tenets are followed (Shipp, 1981).

Ex-post cost-benefit analysis is employed when alternative programs are being considered, the program impacts are known, and the benefits can be expressed in monetary units (Rossi & Freeman, 1982). Ex-post cost-effectiveness analysis allows for comparing the costs of different programs that achieve similar goals or for determining the various costs used to obtain different levels of goal attainment (Rossi & Freeman, 1982). The program outcomes must be known in both cases, but in cost-effectiveness the benefits are expressed in outcome units rather than monetary units. The avoidance of placing dollar values on program outcomes makes cost-effectiveness the preferred technique for use in human service organizations (del Bueno & Kelly, 1980; Johnson, 1986; Prescott & Sorenson, 1978).

Cost-benefit and cost-effectiveness analyses offer other advantages to a department. The application of accounting techniques to the program decision-making process forces consideration of goals and objectives to be achieved, evaluation criteria to be used, identification of available alternatives, and assignment of values to the costs and benefits of the alternatives (McLaughlin, 1983). Bootman et al (1979) suggested that this procedure reduces the effects of personal bias and intuition on the decision. Information obtained from cost-effectiveness analysis may identify the need to change course objectives and/or educational methods (Johnson, 1986). Attempts to utilize cost-effectiveness procedures uncover departmental deficiencies in evaluation techniques (del Bueno & Kelly, 1980), since reliable evidence linking the program to learning and/or performance is necessary for the analysis.

### **Limitations of Cost-Benefit/Cost-Effectiveness Analysis**

Potential uses and benefits of cost-benefit and cost-effectiveness analysis should be viewed relative to the limitations and costs to the department. Rossi and Freeman (1982) outlined the major limitations surrounding resource allocation as a newly emerging field. Controversies surround the underlying assumptions made in determining monetary values of program inputs and outcomes and which costs and benefits to include in an analysis. The definitions and measures influence the conclusions, as does the adoption of a particular accounting perspective.

In cost-benefit analysis, program benefits may be calculated for the individual, the institution, or the community at large (Rossi & Freeman, 1982). Total outcomes will vary for each of these accounting perspectives. Educators have been most interested in program impact on the individual learner, or what changes this course made in the nurse's actual practice. Hospital administration may adopt an institutional perspective, or how nursing staff development programs benefit the overall organization. The ben-

efit of educational program to the community at large may be the most problematic perspective to define and measure. However, this perspective could be invaluable in proving the worth of educational program expenditures to the consumer.

Confusion over which accounting perspective to adopt is a relatively minor problem compared to other limitations of cost-benefit analysis. Klarman's (1974) discussion of the problems of counting, measuring, and valuing costs and benefits has implications for the educational setting. The decision of which costs and benefits to include in the analysis and which ones to exclude directly influences the conclusions.

Prescott and Sorenson (1978) pointed out the difficulty in obtaining financial data about program costs in human service organizations. The resources needed to calculate the costs include access to cost data, expertise in accounting methodology, and time. Although several authors have proposed guidelines for educational program cost evaluations (del Bueno & Kelly, 1980; Johnson, 1986; Shipp, 1981), cost analysis for an individual department still requires the resources mentioned above.

The problem of measurement of program benefits applies to both cost-benefit and cost-effectiveness analysis. As previously stated, program impacts must be known in advance. This requires the documentation that learners have "achieved the expected levels of knowledge intake and competence in task performance within the specific parameters of the given course objectives" (Hefferin, 1987, p. 29). Klarman (1974) emphasized that the link between program costs and outcomes must be empirically based; without the empirical link, the hypothetical relationships between costs and benefits is only an academic exercise.

To establish the empirical link between cost and outcomes requires sound evaluation research methodology. Prescott and Sorenson (1978) discussed the program evaluation process necessary to obtain reliable and valid measures of program outcomes that reflect important dimensions of the program. A review of the evaluation research process will quickly point out the deficiencies in program evaluation existing in many staff development departments as well as the requirements and resources necessary to perform evaluation research. The minimal resources include: personnel with research expertise; time to design and implement the research process for the educational program, including follow-up performance evaluations; and access to statistical expertise and computerized data analysis. Kelly (del Bueno & Kelly, 1980) stated that obtaining reliable data from impact evaluation took 50% of a staff development department's time.

The problem of quantification of benefits or translating program outcomes into monetary terms is a challenging situation. As Shipp (1981) pointed out, many desirable changes or benefits of continuing education (such as improvement in patient care) cannot be assigned a market value. The tendency to omit benefits that cannot be assigned a dollar value underestimates the total benefits of the program (Klarman, 1974). For staff development

programs, the dilemma can be avoided by retreating to cost-effectiveness analysis, as suggested by del Bueno and Kelly (1980). However, the ability to set priorities among differing, competing programs has then been lost (Klarman, 1974).

Cost-effectiveness analysis can be very difficult to calculate when two or more types of outcomes are sought as the program goals (Klarman, 1974). For instance, if the goals of an educational program are to retain qualified nursing staff, to reduce infant mortality, and to decrease the spread of infection in the neonatal unit, then common or weighted outcome measures must be calculated for alternative programs. Klarman (1974) stated that where all outcomes are important, the weighting of outcome measures brings up the valuation issue one is trying to avoid by using cost-effectiveness analysis.

The final limitation concerns the political forces surrounding the situation in which cost-benefit or cost-effectiveness analysis is used (Klarman, 1974; Rossi & Freeman, 1982). Politically astute educators will not waste the valuable resources required to produce efficiency data in situations where the decision is purely political. However, politically smart educators also know how and when to use cost-benefit/cost-effectiveness calculations to influence resource allocation decisions.

Both Grubb (1981) and Shipp (1981) mentioned that nursing staff development programs in hospitals are not usually evaluated in terms of their contribution to the hospital's overall objectives. Rather, the change in knowledge or job performance of the nurse participant is evaluated. Kelly (1985) also emphasized the necessity of proving how staff development expenditures contribute to the organization's goals and survival. The measurement and calculation of benefits to the institution associated with nursing education programs are politically smart methods of justifying educational expenditures. The political manipulation of cost-benefit/cost-effective data, however, may be morally questionable to some educators.

### A Framework for Decision-Making

In the preceding sections, the potentialities and limitations of cost-benefit and cost-effectiveness analysis have been examined. The controversies surrounding resource allocation techniques makes the decision regarding their use in educational departments at best an educated guess. As Kelly stated "there is no single, correct and simple efficiency analysis" (1985, p. 10); there is also no simple or right decision.

An informed decision is one that optimizes the use of available resources in meeting both departmental and organizational goals. The following questions provide a framework for weighing the benefits and costs of efficiency analysis in terms of the needs and priorities of the department.

1. What are the potential applications of cost-benefit and cost-effectiveness analysis in this department?
2. How will the results from the analyses be used to benefit the department and the organization?

3. Are the cost and outcome data needed for the calculation of cost-benefit and cost-effectiveness ratios available?
4. Does the department possess the necessary resources to perform cost-benefit/cost-effectiveness analysis?
5. Is cost-benefit/cost-effectiveness analysis a departmental priority in terms of utilization of resources?

### Conclusions

Budgetary constraints faced by health-care organizations have affected hospital-based educational departments. Cost-benefit and cost-effectiveness analysis has been proposed as one way to justify educational expenditures and assist with resource allocation decisions. However, these analytical tools may not be the most efficient use of a department's resources.

The limitations discussed in this article serve as warning flags that require further exploration within the individual department. For example, a lack of reliable evidence of program impact indicates evaluation deficiencies. Impact evaluations require resources such as research expertise, personnel time, and access to statistical analysis, yet cost-benefit/cost-effectiveness analyses rely on these outcome data. Kelly (del Bueno & Kelly, 1980) reported that impact evaluation in one department required an increase from 25% to 50% of the instructor's total time. With educational positions being cut and learning needs escalating (Sovie, 1985), the decision to spend half of a department's manpower resources on evaluation may be difficult to justify to administrators.

This example illustrates the paradox of the cost-benefit/cost-effectiveness analysis decision faced by hospital education departments. Results from efficiency analyses are needed to prove the inherent worth of the educational department and its expenditures, especially when hospital budgets are being cut, yet the resources required to obtain the results are not available because of these cuts. It makes more sense to utilize cost-benefit/cost-effectiveness techniques when resources are plentiful and to pull out the results during times of hardship.

An informed decision will reflect a thorough understanding of the potentialities and limitations of efficiency

analyses as they relate to the needs, resources, and priorities of the educational department. The goal should be to maximize the benefits obtained through the efficient utilization of a department's resources.

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