



*COMMITTEE OF THE WHOLE  
MEETING*



*OCTOBER 14, 2002*

Committee Minutes  
Board of Education  
October 14, 2002

The members of the Board of Education met for a Committee Meeting on Monday, October 14, 2002 at 7 p.m. at the Don Stroh Administration Center, 5606 South 147th Street. The agenda items a report on insurance coverage, Program Evaluation, and an update on the advertising policy.

PRESENT: Mike Pate, Brad Burwell, Linda Poole Julie Johnson, and Jean Stothert

ABSENT: Sheri Everts Rogers

COMMENTS FROM THE PUBLIC:

Tony Levy, president of the Millard Education Association, encouraged the board to consider teachers being included on the program evaluation committee.

Don Kamins and Bill Johnson, insurance consultants, reviewed the description of the various coverage and possible concerns, as it would relate to property, casualty, and liability insurance. They provided the district with a premium summary listing the expiring premiums, projected premiums for 2002-2003, and what the actual premiums are for 2002-2003. In addition they provided a marketing summary, which lists quotations from various insurance companies. Also included were loss trends and liabilities that may face the field of education.

John Crawford explained the process being developed to identify underutilized and ineffective programs for either revision or elimination. One difficult aspect will be the timing when evaluations are completed and being considered in the budgeting process for the next year. The recommendation would probably be made for a revision or the elimination of a class to take place in the year after the current program budgeting year.

The advertising policy was reviewed. The board indicated they would like to meet with the City of Omaha's Zoning Board to get a better understanding of their decisions on sign placements in the school setting.

  
CHAIRMAN

## MILLARD PUBLIC SCHOOLS

### BOARD MEETING NOTICE

The Board of Education will meet on Monday, October 14, 2002 at 7:00 p.m. at the Don Stroh Administration Center, 5606 South 147th Street.

Public Comments on agenda items - This is the proper time for public questions and comments on agenda items only. Please make sure a request form is given to the Board Vice-President before the meeting begins.

#### A G E N D A

1. Insurance Report
2. Program Evaluations
3. Advertising Update

## AGENDA SUMMARY SHEET

**AGENDA ITEM:** Insurance Report

**MEETING DATE:** October 14, 2002

**DEPARTMENT:** Business

**TITLE & BRIEF DESCRIPTION:** Insurance Report – A report from the Harry A. Koch, Co. (HAKCO) regarding the District property, casualty, and liability insurance coverage.

**ACTION DESIRED:** Approval  Discussion  Information Only

**BACKGROUND:**

The District's insurance consultants for property, casualty, and liability insurance (i.e., HAKCO) meets on a regular basis with the District's Associate Superintendent for General Administration to review matters related to insurance coverage. At those meetings, certain decisions related to coverage are made.

The purpose for this meeting with the Board is to briefly review the major decisions that have been made related to property, casualty, and liability insurance and to hear any comments or concerns the Board may have with the current policies (i.e., coverage, exclusions, retained risks, costs, etc.)

**OPTIONS AND ALTERNATIVES:** n/a

**RECOMMENDATION:** n/a

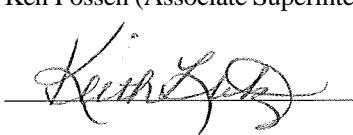
**STRATEGIC PLAN REFERENCE:** n/a

**IMPLICATIONS OF ADOPTION/REJECTION:** n/a

**TIMELINE:** n/a

**RESPONSIBLE PERSON:** Ken Fossen (Associate Superintendent for General Administration)

**SUPERINTENDENT'S APPROVAL:**

  
\_\_\_\_\_

## AGENDA SUMMARY SHEET

**AGENDA ITEM:** Superintendent's Goal 1 and Evaluation of Programs

**Meeting Date:** 10/14/02

**Department:** Planning and Evaluation

**Title and Brief**

**Description:** In response to strategic parameters, superintendent's goal #1, and restricted funding, we are requesting dialog with the Board about methods for assessing utilization and effectiveness.

**Action Desired:** Approval  Discussion  Information Only

**Background:** An evaluation model will be discussed to indicate the direction proposed to address the superintendent's goal. A broad-based committee will sit as a "review" board and will sign off on evaluation reports. Also included in this packet is a recent article describing the state of the art of cost-benefit analysis in education.

**Options/Alternatives Considered:**

N.A.

**Recommendations:** If the board agrees we are on the right path, we will proceed apace.

**Strategic Plan**

**Reference:** Strategic parameters.

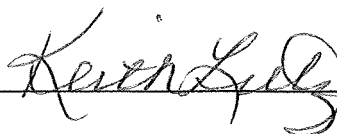
**Implications of Adoption/Rejection:**

N.A.

**Timeline:** Begin implementing in 2002-03.

**Responsible Persons:**

**Superintendent's Signature:**



## Millard Public Schools

### Superintendent Goal #1:

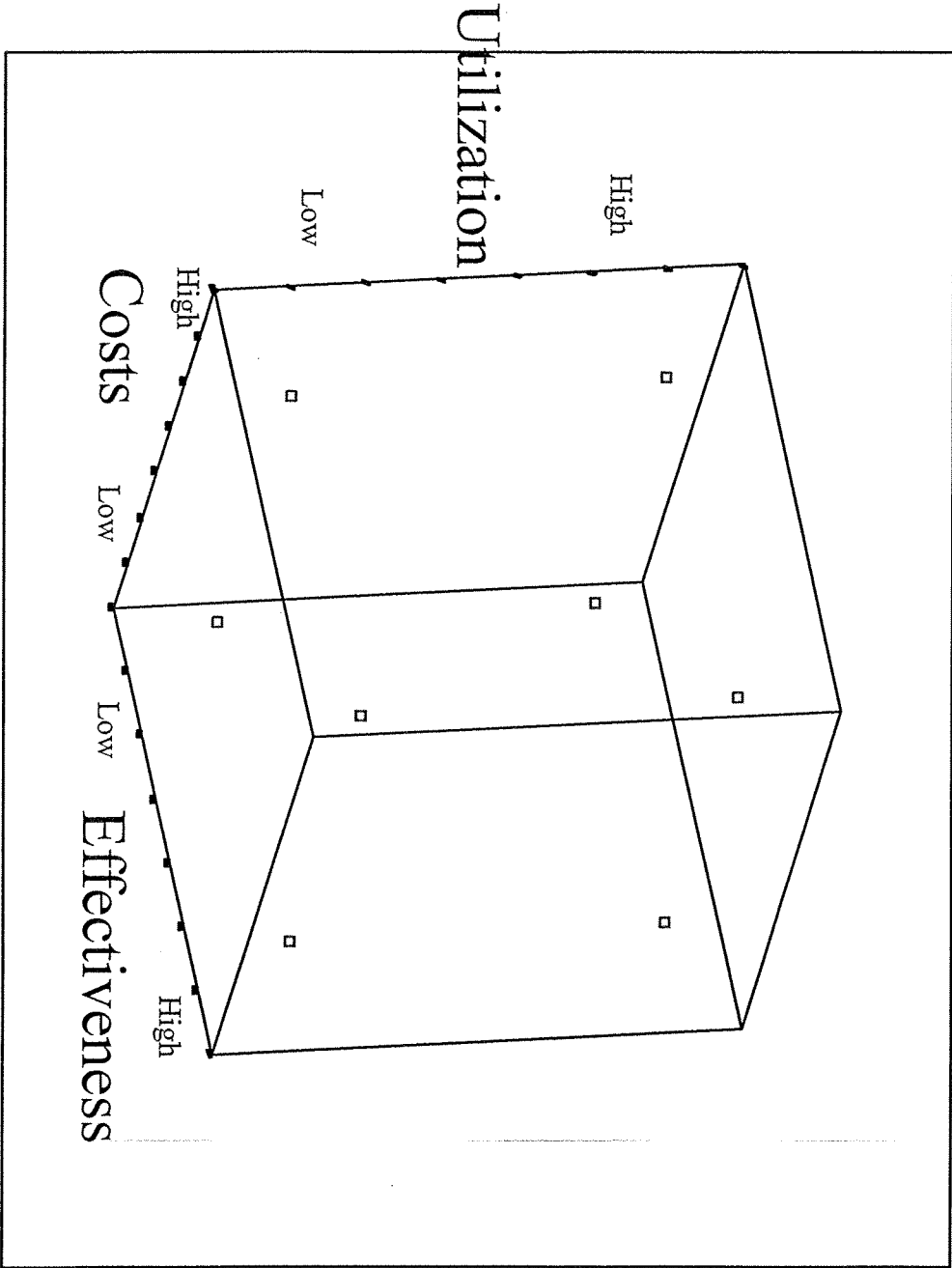
- 1. The superintendent will study possible solutions to the challenges presented by the state limitations on expenditures and levies, including, but not limited to, an articulated district process for phasing out underutilized programs and buildings.**

The current focus is on the process for "phasing out underutilized programs". The proposal is to base such decisions on evaluation results pertaining to: (1) degree of utilization, (2) cost, and (3) the effectiveness of the program.

A three-dimensional model of program evaluation will be discussed (graphic on following page). That discussion will address the possible findings on programs that might be high or low on the varying dimensions – e.g., low utilization, but highly effective, and low in cost vs. high utilization, low on effectiveness, and high in cost, etc.

The attached proposal was written last year as an attempt to begin to design a process that not only involved the office of Planning and Evaluation, but also made use of a "review" committee that would, in effect, sign off on evaluations, prior to being submitted to the superintendent and the board.

# Evaluation Model



## ***Process to Identify Underutilized and Ineffective Programs***

At the direction of the superintendent, this process is being developed to allow programs and/or services to be identified for potential modification or discontinuance. The goal is to have data-based decision making in the critical process of possibly eliminating existing programs.

The context for this decision making exists within the district's strategic plan. There are two parameters that compel us to examine programs from a cost-benefit perspective. One parameter states that no *new* program will be put in place unless it includes provisions for possible impacts on other services, and passes a cost-benefit analysis (based on evaluation results). New programs such as block scheduling at West High, Core Academy, Montessori Middle School, and the grant-based Summer School Program have been analyzed through the lens of this strategic parameter. The other strategic parameter says that no *existing* program will be *maintained* unless it clearly supports the district mission and survives an evaluation-based cost-benefit analysis. The former parameter has been easier to follow than the latter.

This document is intended to lay out a process that, if followed, would allow us to identify programs for possible modification or elimination.

### Identification of Programs

The first step would be to go to a broad-based group, such as all administrators or --- a large group such as the program-budgeting team, to solicit the first list of programs nominated for analysis. This initial list could be started by analyzing all programs not required by Rule 10, the Nebraska accreditation rule. A Q-Sort or modified Delphi



technique could be used with this large group to identify a list of perhaps as many as 25-30 programs for further analysis.

Then, a group of central office and building administrators would be charged with the task of reducing this list of programs for analysis down to approximately 10 different programs. This group would consider numbers of students and staff impacted, along with any potential savings to the district budget. The recommendations of approximately 10 programs would then go to the superintendent, who would narrow the selections down to 5 to 8 programs, considering likely board reactions, political impacts, and required budget reductions. These 5 to 8 programs would need to be related to significant potential cost savings, so that – if one or more were cut – the district would realize a meaningful gain in budget capacity to fund other higher priority initiatives.

#### Convene "Cost-Benefit Evaluation Committee"

The "Cost-Benefit Evaluation Committee" (CBEC) would be given the charge of analyzing the 5 to 8 programs that resulted from the above-described process. The primary methodology would be program evaluation, using both qualitative and quantitative approaches, and – when possible – making use of comparisons of program students vs. similar students not served by the program being assessed. This committee would be composed of district administrators as well as individuals with expertise in evaluation and/or-in cost analysis who are not employed by Millard Public Schools. The Executive Director of Planning, Evaluation, and Information Services will chair this committee, which serves in an advisory capacity to the superintendent.

The CBEC will include representatives from:

- Planning, Evaluation, & Information Services Department
- The Educational Services Division

#### The Business Office

- Building Principals (1 Elementary, 1 Middle, 1 High)
- Outside/External Evaluators
  - DeLoitte-Touche or Kirkpatrick-Pettis
  - Chamber of Commerce
  - Educational Evaluator
- "Ex Officio" members representing the programs chosen for evaluation (attending as needed)

The charge to the CBEC is twofold:

- (1) First, to examine programs to determine if they are underutilized (low enrollment, lack of participation), and if underutilized, to produce a cost analysis, resulting in expenditure-per-student results; and (2) For all identified programs, analyze effectiveness (where possible, in relation to student achievement goals) – identify goals and determine the degree to which the goals are being achieved.

#### Relationship to Program Budgeting and Issues of Timing of Recommendations

Millard Public Schools is engaged in Program Budgeting, in which teams of administrators develop proposed budgets at several different funding levels. "Programs" in that context are very broadly defined (for example, "Elementary Education" is a "program"). The work of the CBEC is to be focused on more discrete programs or courses of study, that can be identified and analyzed in a program-evaluation setting. These could be individual classes at the secondary level, or could be special delivery models that are going through a piloting or phase-in process.

One question to consider is how any recommendations to reduce, modify or eliminate a program (coming from the CBEC) would fit with the budget proposals of the groups involved in developing the budgets. The timing of any evaluation work will likely conclude at the end of the school year (allowing for achievement or other data to come in at the end of the year); program budgeting is essentially completed by April (at

least the development of the budgets – the hearings, the superintendent's adjustments, and the board approval run through the summer months).

One option would be to have the recommendations by the CBEC be considered for implementation in the year after the program budgeting year. For example, if a program were recommended for deletion, it would not be eliminated the following fall, but rather a year from the following fall. Another option would be to implement a program reduction immediately, if possible, and that action would simply create more capacity in the upcoming budget to fund something that would not have otherwise been able to receive funding.

Timelines:

August	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July
<b>Program Budgeting Timeline</b>											
Budget Projections, Development of Parameters											
					Budget Development by Program Teams						
								Q-Sort Ranking by District Budgeting Team			
									Supt. Review, Input, Board Approval		
<b>Program Evaluation Timeline</b>											
Development of Target List of 5-8 Programs											
			Convene CBEC to begin Evaluations								
				Collect Requisite Data (through end-of-year)							
										Analyze Results, Form Recommendations	

Recommendations to the Superintendent

If the CBEC reached consensus to recommend dropping a program (or significantly modifying it in such a way as to reduce costs), and if contracts and other considerations permit, it could impact that immediately-upcoming budget. The program budgeting process involves drawing a line that demarcates the available funding in a rank-ordered list of programs. Any cost savings from the dropped program could allow

that line to "move down" the ranked list, thereby funding some program(s) that would otherwise have been below the available resource line. Otherwise, the program could be allowed to operate one more year, and then would drop out of the budget for that subsequent year's budget.

*A note to our subscribers:*

The next issue of *Review of Educational Research*  
 (vol. 72, no. 2—Summer 2002) is scheduled to mail in the fall.

## The State of Cost-Benefit and Cost-Effectiveness Analyses in Education

Barbara Hummel-Rossi and Jane Ashdown  
 New York University

*National and local pressures to improve student achievement, to implement educational reforms, to increase services to "at risk" students, and to monitor the size of education budgets all function as motivators for educators to consider the use of cost analysis in decisions about resource allocation. Yet the application of cost-benefit and cost-effectiveness analyses in education is limited. The authors explore the advances in cost-benefit and cost-effectiveness analyses that have been made in the human services, health, and medical fields, and they identify the difficulties and analyze the issues involved in applying these analyses in education. They make recommendations for assessing costs and measuring effectiveness in educational evaluations, discuss the strengths and weaknesses of several exemplar cost-benefit and cost-effectiveness educational studies, and provide a protocol to guide future analyses.*

**KEYWORDS:** *accountability, cost-benefit, cost-effectiveness, economic evaluation.*

Why invest in education? It is widely believed that using public money to provide education will benefit society at large by generating increased wealth, improved employment opportunities, and reductions in social problems (Carnoy, 1994; Hy, 2000). However, competing policy alternatives and the necessity of raising funds for education through taxes test this belief. Recently, researchers have demonstrated that increased money can make a positive difference in student achievement (Greenwald, Hedges, & Laine, 1996; Verstegen & King, 1998). Establishing a clear link between funds spent on education and specific student achievement outcomes has proved difficult and controversial (Hanushek, 1989, 1994; Hedges, Laine, & Greenwald, 1994). Researchers have cautioned policymakers that unless the issue of how money is spent is addressed, simply allocating more money to education will not necessarily result in increased student achievement or the reduction in pressing inequities and inefficiencies in the delivery of educational services. Furthermore, to make informed decisions about how best to allocate funds, educational decision makers need more complete information on the relation between expenditures and student achievement outcomes that includes details of how services are delivered (Chambers, 1999).<sup>1</sup>

Educators can look to the field of economics for methods for organizing data and for procedures that provide linkage between resource inputs and outcomes. Economic evaluation that broadly considers how to optimize the production of

particular outcomes within budgetary constraints, given certain inputs, can guide such choices (Barnett, 1993; Chambers, 1999). More specifically, economic evaluation in education applies economic theories and analytic tools to resource allocation problems (Levin, 1983). These analytic tools include a "family" of cost analysis techniques, such as cost-benefit analysis and cost-effectiveness analysis. Writing broadly about social policy evaluation in 1975, Rothenberg noted: "Cost-benefit [analysis] is an apparatus to be wielded by an agent of the society for the purpose of informing it about desirable directions of action, and perhaps undertaking such action on behalf of society" @. 56). His words are as true today as when he wrote them. Yet, as one examines the field of education, few studies are found in which cost-benefit and/or cost-effectiveness analyses are undertaken in relation to program decision making. This is surprising as many new educational initiatives involve significant expenditures and there are increased demands from interested constituencies for evidence of positive student outcomes resulting from the outlay of public funds.

Levin (1975), a protagonist for economic evaluation, demonstrated the applicability of cost-effectiveness in a seminal chapter in the same highly regarded *Handbook of Evaluation Research* in which the 1975 Rothenberg chapter appeared. The Levin and Rothenberg chapters are considered to be the first writings seriously advocating the use of economic evaluation in educational decision making to appear in the educational literature (McLaughlin & Phillips, 1991). Levin continued to champion cost analysis techniques in another chapter in an evaluation methods book (1981) and in his own book, *Cost-Effectiveness: A Primer* (1983), which expanded on methods and techniques. This 1983 primer for educational practitioners addressed a range of cost analysis methods. In particular, the primer distinguished among the following:

- cost-benefit analysis, in which both inputs and outputs are measured in monetary units;
- cost-effectiveness analysis, in which comparisons are made among alternatives whose inputs and outputs are not solely monetary;
- cost-utility analysis, in which alternative programs are compared based on the costs of inputs and the estimated utility or value of their outputs.

Despite these contributions, in a 1991 retrospective examination of the cost-effectiveness literature, Levin commented that progress had been slow in the adoption of either cost-effectiveness or cost-benefit analyses in educational evaluations. He noted that less than 1 percent of the presentations at the Annual Meetings of the American Evaluation Association between 1985 and 1988 discussed or included cost-effectiveness analyses; the proportion was even smaller at the Annual Meetings of the American Educational Research Association for the same period. Levin attributed the low application of cost-effectiveness methods in education to the fact that few university programs for educating evaluation specialists include training in cost analysis. Further, Levin asserted that in contrast to the field of economics, the decision makers in education who might make use of cost-effectiveness analysis information, such as administrators and educational evaluators, are unfamiliar with the methods and do not know how to use the data derived from such analyses.

In a concern for appropriate analysis of costs in educational reform, Monk and King (1993) examined evaluation studies published between 1988 and 1992 in the *Journal of Educational Evaluation and Policy Analysis (EEPA)* and found that only 14 percent had some extended treatment of cost, as compared to 28 percent for the *Journal of Policy Analysis and Management (JPAM)* for approximately the same period. Monk and King noted that *JPAM* is focused on broader areas of policy, such as hospital admission procedures, issues of child support collection, and speed limit restrictions, whereas *EEPA* is strictly concerned with educational policy and implications for reform. The authors attributed the lower utilization of cost analyses in *EEPA* evaluation articles to the complexity of the inputs and outputs in education, as compared to some other areas of policy evaluation. Analyzing this complexity, Monk and King argued that the educational cost analyst does not understand how the educational process itself translates into desired student outcomes and this situation is unlikely to change in the near future. In particular, there are subtle, difficult to value, and interdependent costs in educational programs that must be fully comprehended in order to conduct a thorough economic evaluation.

As we analyze the current state of economic evaluation in education, we see little change since Levin's 1991 and Monk and King's 1993 analyses. Levin and McEwan's (2001) revision of Levin's (1983) earlier primer also indicates that there has been little increase in the application of cost analysis methods in education. However, our review of the literature on economic evaluation in the health and medical fields reveals that the application of cost analysis methods has made significant strides.

In this article, we first examine the progress that has been made in the health and medical fields. We then consider the methodological guidance offered by an outstanding example of a cost-benefit analysis, the Perry Preschool Program (Barnett, 1985), and the author's subsequent recommendations for both cost-benefit and cost-effectiveness evaluations in the field of human services (Barnett, 1993). Specific conceptual and measurement problems limiting progress in applying economic evaluation in education are then analyzed. Particular attention is paid to the deliberations made by a New York State panel on cost-effectiveness (New York State Board of Regents, 1996). Next we critique the application of cost-effectiveness analysis in four educational evaluations and the strengths and weaknesses of these particular studies as potential models for educational decision making. At this point, we focus on cost-effectiveness analysis because of its greater potential for application in education, although much of our critique has application to other cost analysis methods, such as cost-benefit analysis. We then synthesize the strengths of the work in cost-effectiveness analysis in education, human services, and health and medicine and present a protocol for conducting cost-effectiveness analysis in education. Finally, we consider the attractions and incentives for education policy-makers in applying this protocol. It is important to note that our discussion is limited to studies conducted in the United States, although we recognize that a substantial number of international studies have been undertaken (Levin & McEwan, 2001; Tsang, 1997). We make this restriction due to difficulties in comparing educational inputs and outputs across international education systems with different funding sources, teacher education requirements, school age and promotion policies, access to educational services, and philosophies toward educational opportuni-

ties. Greenwald, Hedges, and Laine (1996) made a similar decision, citing the differences in international educational systems that make cross cultural comparisons and generalizations difficult.

### Applying Cost Analysis Methods in the Health and Medical Fields

The health and medical fields have been forced to seriously examine costs for health care relative to benefits and effects. Compelling reasons include pressure to contain escalating health costs (Johnson, 1989), changes in fee reimbursement systems (Sherman, 1990), the aging of the population and concomitant increased health care needs (U.S. Department of Health and Human Services, 1996), the cost of expanding technologies (U.S. Department of Health and Human Services), and the allocation of resources for possible effective interventions for critical diseases such as HIV (Holtgrave & Pinkerton, 1998; Pinkerton & Holtgrave, 1998). With these pressures, the development and use of cost-benefit and cost-effectiveness methodologies in the health and medical fields have moved forward at a faster pace than has been the case in education, and one finds more rigorous cost evaluations in health and medicine than in education. Furthermore, cost-effectiveness analyses in health and medicine have led to changes in practice. For example, studies have demonstrated the cost-effectiveness of using cholesterol-reducing drugs for both primary and secondary prevention of heart disease (Buerhaus, 1998).

With this increased use of cost analysis in health and medical policy decision making came the development of corresponding measures of success or outcomes. Simply using years of life gained through a health or medical intervention was considered inadequate. Instead, an outcome measure that reflects both the length and the quality of the health that an individual experiences has been used frequently. This measure, Quality Adjusted Life Years (QALYs), is based on utility theory (Gold, Siegel, Russell, & Weinstein, 1996; Weinstein & Fineberg, 1980). Utility theory is a quantitative approach towards selecting the best course of action using the probabilities of various outcomes and the utility or strength of preference for a particular course of action for each outcome. QALYs has proved useful for comparing outcomes across various health and medical interventions. However, there does not appear to be a clear consensus in the field regarding how to measure the quality of life. QALYs has been criticized by some as being too complex (Cox, Fitzpatrick, Fletcher, Gore, Spiegelhalter, & Jones, 1992) and by others as being too simplistic (Mehrez & Gafni, 1989, 1993), but it has become the dominant outcome measurement method in the health and medical fields with various measures of health quality applied (Gold et al., 1996).

Cost analysis had been used with enough frequency in the health and medical fields that in 1993 the U.S. Public Health Service appointed a panel of 13 experts in cost-effectiveness analysis to review the state of cost-effectiveness studies in health and medicine and to examine cost-effectiveness methodology as one tool that could contribute to decision making concerning improvements in national health. This Public Health Service (PHS) panel was charged with reaching consensus about recommendations for methodological changes in the conduct of these studies. The goal of the panel's work was to produce a document to serve as a resource for the improvement of data available for policy decisions. The lengthy and detailed report of this panel (U.S. Department of Health and Human Services,

1996) contained analyses and recommendations for change in seven areas in order to address methodological problems that had limited the value of prior studies. These recommendations were:

1. A societal perspective should be adopted in any study, as the study should represent the public interest, rather than a particular viewpoint, such as that of a health insurance company.
2. Outcomes should include the measurement of both benefits and harms of an intervention and should include QALYs. Estimations of outcomes may need to be gathered from sources other than randomized clinical trials, such as direct observations or extrapolations from other studies.
3. Costs should reflect all major categories of resource use, including non-health impacts of an intervention.
4. In selecting comparators, alternative health interventions should be compared to existing practice.
5. Discounting of cost and health outcomes to present value needs to be undertaken in order to account for the generally recognized preference of consumers for present over future consumption.
6. Uncertainty about the value of any key variable in a study should be accounted for in a sensitivity analysis that evaluates the impact of such uncertainties on the cost-effectiveness ratio.
7. Reporting on a cost-effectiveness study should highlight results from a reference case and be disseminated via a journal article and a comprehensive technical report.

In addition, the report included an important caveat that referred to ethical limitations in using a cost-effectiveness analysis in resource allocation. The panel cautioned that a cost-effectiveness ratio provides important information, but should not be the sole criterion for decision making.

A key contribution of the PHS panel report (U.S. Department of Health and Human Services, 1996) was the inclusion of two comprehensive cost-effectiveness reference studies. The first study (Kelly, Haddix, Scanlon, Helmick, & Mulinare, 1996) addressed the cost-effectiveness of various strategies to prevent neural tube defects in infants, and the second (Stinnett, Mittleman, Weinstein, Kuntz, Cohen, Williams, et al. 1996) compared the cost-effectiveness of different therapies for cholesterol reduction in adults. These studies can serve as "reference cases" that function as models for other researchers. The PHS panel recommended that all future cost-effectiveness studies include, as a component of the study, a reference case analysis that conforms to the panel's recommendations. The panel recognized that at times the scope of a stakeholder's needs relative to the panel's recommended cost-effectiveness analysis might not be in complete harmony with the panel's recommendations. However, by conducting a core analysis (reference case) that conformed to the recommended procedures, followed by additional analyses that address the stakeholder's requirements, the cost-effectiveness analysis would provide comparison data for other cost-effectiveness evaluations as well as meet the local needs. The panel noted that in the health and medical fields there are many stakeholders and a cost-effectiveness analysis could serve many masters. Therefore, they recommended that two reports be written: a technical report that includes the reference case and a professional journal article.



Education faces parallel problems. School administrators, teachers, school boards, students, parents, tutoring companies, textbook publishers, and taxpayers all have a stake in educational resource allocations and decision making. Our problems in education are not unique, and we might take a cue for solutions from the fields of health and medicine where there are similarly diverse stakeholder interests. In the following sections, we draw, in part, from these fields to explore a methodology to use in conducting cost evaluation at the school level, where it typically has not been used in resource allocation decision making.

**Developing a Sound Methodology in Education**

The educational literature contains a limited number of prominent cost-benefit and cost-effectiveness studies conducted in the United States. However, these studies can provide methodological guidance to the field. An outstanding example is the famous cost-benefit analysis of the Perry Preschool Program (Barnett, 1985), in which 123 low socioeconomic status (SES) children, ages three and four years, were assigned to an experimental or a control group. The experimental group received the preschool program, and the control group had no preschool intervention. The children were followed until age 19. Costs and outcome variables, such as years in special education, high school graduation, postsecondary education, employment, welfare, and criminal record, were examined relative to the costs of the program. Monetary benefits were estimated for participants, society, taxpayers, and potential crime victims. The preschool program was found to be particularly profitable for taxpayers. The Perry Preschool study has been instrumental in shaping public policy supporting funding for early intervention with disadvantaged children. The study is noted throughout the literature as an exemplar in its methodology, particularly its longitudinal follow-through.

Following his Perry Preschool study (1985), Barnett (1993) gave further methodological direction in conducting economic evaluations of human service and education programs and developed a practical schema for this purpose. Using home visiting parent support programs as an application, Barnett identified nine steps to be taken in a cost-benefit or cost-effectiveness evaluation. These steps are as follows:

1. The perspective of an economic evaluation must be defined. That is, will the costs and consequences of a program be considered from the perspective of an individual or society as a whole?
2. Cost analysis should include estimates for all resources used, including volunteered time.
3. Program effects optimally should be evaluated based on a sufficient sample size, an experimental design, and a broad perspective on benefits that may accrue over a long period.
4. When cost-benefit analysis is being conducted, outcomes must be valued monetarily.
5. The changes from year to year in the cost of program resources and the value of program outcomes must be adjusted to the rate of inflation. Additionally, future program benefits and costs must be discounted (translated) to present dollar values.

6. Decisions concerning choosing among competing programs should be weighed carefully and should take into account the entire scope of the situation. There are no simple rules for making program decisions.
7. The distribution of consequences across all stakeholders needs to be taken into consideration.
8. Attention should be given to potential variations in critical assumptions on which the evaluation was based.
9. Program effects that are not easily valued and quantitatively measured need to be considered as part of the evaluation.

Similar to the nine steps cited above which Barnett proposed were the recommendations of the PHS panel (U.S. Department of Health and Human Services, 1996) that were referred to earlier. These PHS recommendations were designed to be used as a protocol for cost-effectiveness studies in health and medicine. A careful examination of Barnett's recommendations and those of the PHS panel revealed interesting similarities and differences. In Table 1, the recommendations made by these two sources are provided for comparison. The descriptors (e.g., Perspective, Costs, Scope of Analysis, etc.) used in Table 1 and in the following discussion are

**TABLE 1**  
*Comparison of Barnett's (1993) and U.S. Public Health Service Panel's (1996) recommendations for conducting cost-effectiveness analyses*

Barnett	Public Health Service Panel
<i>Perspective:</i> Guided by evaluation goals.	<i>Perspective:</i> Welfare of society.
<i>Costs:</i> Ingredients approach.	<i>Costs:</i> Resource cost approach.
<i>Scope of Analysis:</i> Program alternatives should be defined.	<i>Comparators:</i> Existing practice if cost-effective; otherwise, use reasonable alternatives.
<i>Estimate Program Effects:</i> Favors true or quasi-experimental design.	<i>Outcomes:</i> Calls for attention to design details and advocates use of randomized controlled trials. Recommends use of QALYs as outcome measure.
<i>Qualitative Residual:</i> Needs to include difficult-to-value outcomes.	<i>Discounting:</i> Advocates a discount method, a specific discount rate, and sensitivity analysis at an alternate rate.
<i>Time Effects:</i> Recommends adjusting for inflation and discounting future costs to present value.	<i>Uncertainty:</i> Explore variations in significant assumptions/parameters and impact on the cost-effectiveness ratio.
<i>Sensitivity Analysis:</i> Explore variations in significant assumptions/parameters and impact on the cost-effectiveness ratio.	<i>Ethical Limitations:</i> No simple decision rule; cost analyses alone do not provide answers to best alternatives.
<i>Decision Rule:</i> No simple decision rule; cost analyses alone do not provide answers to best alternatives.	<i>Societal Perspective:</i> Address values beyond economic efficiency such as fairness of health care distribution.
<i>Distributional Consequences:</i> Need to break out the distribution of costs and effects.	<i>Reporting:</i> Recommends technical report available on request and journal report; technical report to include reference case.
<i>Needs:</i> Advocates inclusion of economic evaluations in major research reports.	

Note. The descriptors cited within each column are those that are shared by each source.

those from the original sources and are considered below with a view to their implications for education.

Examining first the Perspective of the economic analysis, the PHS panel recommended that the scope of the analysis should be from the broad societal perspective. An example of the application of this societal perspective is provided by Pinkerton and Holtgrave's (1998) study of the cost-effectiveness of HIV prevention interventions. On the other hand, Barnett (1993) suggested that the perspective should be guided by the goals of the evaluation. Generally, educational evaluations do not take a societal perspective, but rather reflect a more limited point of view. For example, an education evaluator might investigate the most cost-effective way of providing literacy assistance to at-risk students in grades kindergarten through fourth grade. If the evaluation takes only the school's perspective and fails to account for a broader point of view, including that of parents or community volunteers who may contribute time to a program, then important costs and effects may be ignored and unaccounted for in the evaluation. Further, the benefits of improving a student's literacy in first grade may extend beyond fourth grade, although educational evaluations rarely consider the long-term effects of an intervention that might have societal implications. For example, increased literacy of elementary school students might result in their later increased higher education that could result in increased contributions to the tax base.

Considering next the analysis of Costs, Barnett (1993) referred to Levin's ingredients model (1983) that involves specifying, and then valuing, all of the ingredients required for a particular intervention. This model recognizes that there are costs of programs that often are not included in a program budget. The PHS panel (U.S. Department of Health and Human Services, 1996) advocated the use of a similar approach and recommended the inclusion of the costs of all resources associated with an intervention, including non-health care costs such as travel and child-care expenses. In addition, the panel cited the methodological problem of the inclusion or exclusion of the costs of future unrelated diseases that the individual might incur as a result of living longer because of the intervention examined in the cost-effectiveness study. While Barnett did not articulate the panel's concern, there are parallel methodological problems in educational evaluation. For example, in the Perry Preschool study (Barnett, 1985), the children who received the preschool intervention completed more public higher education than the controls, thus costing society more than the controls. However, this cost was eventually returned to society through higher wages and taxes on earnings.

Concerning alternative interventions against which to compare a program in a cost-effectiveness study (Scope of Analysis, Comparators), the PHS panel (U.S. Department of Health and Human Services, 1996) recommended that a comparison be made to existing practice to ensure that any health improvements resulting from the interventions are appropriately assessed. However, the panel recommended that existing practice be scrutinized carefully for its health and medical effectiveness and cost-effectiveness. If existing practice is a "do-nothing" approach or is not cost-effective, the panel recommended using reasonable alternatives for comparison, for example a low-cost alternative. The panel cautioned against setting up a straw man as a Comparator. Although Barnett (1993) identified the need to specify alternative interventions being compared, he did not address the criteria for identifying and evaluating these alternatives.

Both sources recommended the need for rigorous experimental design and attention to details, such as the sampling plan (Estimate Program Effects, Outcomes). The PHS panel (U.S. Department of Health and Human Services, 1996) advocated randomized controlled trials as a powerful design tool. With respect to outcome measures, the PHS panel recommended the use of the QALYs measure as one of the outcome criteria. Barnett (1993) emphasized the need for a broad view on the identification and measurement of outcomes produced by a particular intervention, both during the delivery of the intervention and for an appropriate length of time after the intervention is completed. In addition, Barnett introduced the term Qualitative Residual to refer to those outcomes that are difficult to quantify and/or express in monetary units. He noted that some cost-effectiveness analyses might have no clear, consistent measures of effectiveness, given the multiple objectives that might be associated with a human service program.

Both sources (Barnett, 1993; U.S. Department of Health and Human Services, 1996) agreed that from a decision maker's point of view, future program expenditures needed to be examined or "discounted" in terms of their current value (Time Effects, Discounting). That is, program costs must be adjusted for their time value, as money to be spent in the future can be invested now and earn interest, unlike money that must be spent today. The PHS panel went further to recommend a method of discounting both costs and health outcomes over time and recommended a specific discount rate. In addition, Barnett and the PHS panel noted the importance of accounting for price inflation if a program is evaluated across more than one year. Both sources also agreed on the need for Sensitivity Analyses (Uncertainty), in which the important assumptions or parameters (e.g., discount rate) on which the cost-effectiveness analysis is based are varied within reasonable limits to examine how such variations would impact the conclusions.

Both sources were in agreement about the use of results from a cost-effectiveness analysis and indicated that there are no decision rules (Decision Rule, Ethical Limitations) in cost analyses. Cost analyses do not directly identify the best alternatives; rather, they provide information that may assist in decision making. Barnett (1993) included Distributional Consequences as a component of cost analyses that requires the analyst to identify who bears each of the costs and experiences each of the effects of the programs under study. This Distributional Consequences component also addresses the Societal Perspective advocated by the PHS panel (U.S. Department of Health and Human Services, 1996). It allows an evaluation to account for effects impacting more than just the target group and for an evaluation of costs that are sponsored by stakeholders other than the agency directly providing the service or intervention.

Reflecting the different states of development of cost analyses in the respective fields, Barnett (1993) recommended that economic evaluations be included routinely in evaluation reports (Needs, Reporting). However, the PHS panel (U.S. Department of Health and Human Services, 1996) made specific reporting recommendations concerning cost-effectiveness analyses. Two reports should be written, the first being a technical report that includes a reference case and is available on request and the second report being a professional journal article. It should be noted that although Barnett did not make specific reporting recommendations, his own work on the Perry Preschool study (1985) conformed closely to the PHS's reporting standards. As is evident from the comparison of the Barnett and U.S. Department of Health

and Human Services recommendations, the education field does not have as comprehensive and well-defined protocols for cost analysis as do the human services, health, and medical fields. Even with such protocols, researchers in these fields, for example in nursing, continue to examine problems in issues of methodology, application, and reporting (Siegel, 1998; Stone, 1998). In education, Levin's (1983) cost-effectiveness primer and Levin and McEwan's (2001) updated version of this primer come closest to providing a much-needed methodological framework. The lack of a well-defined protocol in education does not completely explain the limited use of cost-benefit and cost-effectiveness studies in education. Other factors, which are explored below, have played a larger role in limiting the use of these analyses.

### **The Conceptual and Measurement Challenges Facing Education**

Educational reforms such as school vouchers and charter schools, shifting demographics that have led to rises and declines in school populations, increasing pressures on educational budgets, and the presence of large numbers of disadvantaged and special needs students, all serve as motivators for educators to consider the use of cost-effectiveness analysis (Levin, 1988). Recognizing this need, the New York State Board of Regents convened a symposium in 1995 to address the issue of "how resources can be used most effectively to foster educational outcomes" (New York State Board of Regents, 1996, p. vii). In convening this symposium, the Board of Regents brought together a panel of experts in educational economic evaluation. Note that this initiative occurred at the same time that the PHS panel was meeting to analyze the state of cost-effectiveness evaluation in the health and medical areas (U.S. Department of Health and Human Services, 1996). The panel of experts in the New York symposium identified three factors hampering the use of cost-effectiveness evaluation in education. These factors related to conceptual and measurement issues; the need for greater understanding by education decision makers regarding the appropriate application of cost-effectiveness data; and the lack of incentives for superintendents, principals, and other stakeholders to use cost-effectiveness analyses in educational decision making. While encouraging the use of cost-effectiveness in decision making, the New York State Regents panel cautioned that it should not be the sole criterion (New York State Board of Regents).

If we are to move forward in the application of cost-analysis research to educational evaluation, we must address some of the major hurdles identified by the New York State Board of Regents (1996). In the following, we examine the first factor identified above, the measurement and conceptual issues regarding the analysis of both costs and effects. Next, to address the second factor, the appropriate application of cost-effectiveness data, we critique the use of cost-effectiveness analysis in four educational evaluations and the strengths and weaknesses of these particular studies as potential models for future applications in educational decision making. We then synthesize the strengths of the work in cost-effectiveness analysis in education, human services, health, and medicine and present a protocol for conducting cost-effectiveness analyses in education. Finally, we consider implications for the application of such a protocol including the last deterrent discussed by the New York State Board of Regents, that of incentives and the role that they might play in promoting the use of cost-effectiveness analyses. We conclude with an analysis of lessons learned from other fields and how we might move forward in education research and evaluation.

In our analysis of models of application, we have chosen to include only cost-effectiveness studies because this analytic tool has the capacity to capture a wide range of effects, including both positive and negative, and those not easily translated into dollar amounts. While cost-benefit analysis has the advantage of converting all benefits into monetary units, which provides ease of program comparison, cost-effectiveness analysis captures more comprehensively the goals of educational evaluation. These goals extend beyond monetary values and assess outcomes in educational terms, such as raising student reading achievement (Levin, 1988). The capacity of cost-effectiveness to capture a wide range of effects was borne out by the prevalence of these studies in the health and medical literature. Gold et al. (1996) present a similar argument for health and medical evaluations, recommending cost-effectiveness analysis over cost-benefit analysis because of cost-benefit's valuation of human life and well-being outcomes in dollar amounts. This reflects our society's value system that rejects comparing the costs of saving a human life with the costs, for example, of building an airplane. With this perspective in mind, we turn to address conceptual and measurement issues regarding the analysis of both program costs and effects.

### *Analysis of Costs*

The analysis of the costs of an educational program is more complex than it initially appears. Although it might seem logical to turn to school budgets as a source of accurate information concerning the costs of an educational program, they are usually insufficient data sources (Iatarola & Stiefel, 1999; Levin, 1988). School budgets show planned expenditures and are not designed to show actual costs for specific programs or students (New York State Board of Regents, 1996). Stiefel, Iatarola, Fruchter, and Berne (1998) found that in order to identify and compare the costs of graduating an individual student from small, medium, and large New York City high schools, they needed to devote considerable resources to developing formulae to untangle the complex variations in which resources were allocated from school to school. Chambers (1999) has identified similar limitations in the use of school budgets in tracing the links between educational expenditure, program delivery, and program effects. He advocates a focus on education service delivery to individual students as the unit of cost analysis rather than the usual school district budgetary codes.

Consistent with Chambers' (1999) recommendations, in order to obtain a complete picture of all costs of an educational program, Levin (1983) and Levin and McEwan (2001) specify using an ingredients approach. This approach involves developing questionnaires, interview schedules, and observation protocols that are used to objectively and systematically collect data on all resources required for program delivery (Levin, 1988, 1995b). These resources must then be valued monetarily and distributional consequences specified. Thus, all cost components and who incurs each of the costs are identified. A matrix of cost components by sources incurring the costs is then created. Rice (1997) extended this approach and created a template or framework to guide the analyst in distributing the costs.

Some costs that are encountered in an educational cost analysis are difficult to value, e.g., the costs of contributed time of parents. Levin (1983, 1995a, 1995b) and Levin and McEwan (2001) suggested that for contributed physical items or volunteer time, it is appropriate to use the market value of the resources as if they had

to be purchased or hired. Rice (1997) and King (1994) suggested keeping volunteered time in natural units (e.g., hours per week) and noted that some communities might not be able to make time or other resource contributions available and, therefore, a particular program requiring such resources might be inappropriate for these communities. The analysis needs to make these "in kind" or "contributed" resources highly visible. As Monk (1995) noted, an analysis of expenditures in a school budget does not distinguish between costs that are required for a program and those that are not required; nor does it necessarily illuminate the distributional consequences of costs that have been assumed or absorbed by another source, such as a state grant or donated teacher time.

Other costs in an educational cost analysis might be hidden. As an example of a hidden cost, Monk and King (1993) cited a typical educational situation in which group-based student performance assessment is employed over several days. The absence of a group member on a particular day could result in inaccurate assessment of the present students because the contribution of the absent group member was missing; further, attempts would have to be made to reconstruct the situation so that the absent student could demonstrate his/her work. As an alternative, the entire assessment could be rescheduled. Depending on the number of groups and number of absent students, the assessment costs could be considerably greater than anticipated. Monk and King referred to these difficult to value and hidden costs as "subtle costs" and cautioned the analyst to be sensitive to them.

Another area that requires attention from the cost analyst is the nature of the population receiving the program or intervention. Different populations present different costs because of varying educational needs. For example, Warfield (1994), in an early intervention study of infants and toddlers with developmental disabilities or delays, found that age at initiation of intervention and level of cognitive impairment were related to the number of hours of service required and consequently the cost. Quinn, Van Mondfrans, and Worthen (1984) examined math programs and found that students of middle to lower SES achieved at a much higher level with a program that emphasized individualized instruction, a potentially more costly instructional program to deliver. However, the individualized approach was more cost-effective than a standard, group-instruction textbook approach. A failure to integrate cost and effectiveness information in this example might have led to different program decision making.

There are several methods for measuring additional expenses incurred in programs with difficult to serve populations. Hartman (1981, 1990) has compared "supplemental/replacement" and "excess costs" as two methods for estimating costs for children receiving special education services. Excess cost, the traditional method for funding special education, is calculated from a formula based on the difference between the cost to educate a special education student and the cost to educate a regular education student. Hartman argues that the excess cost formula leaves expenditures on special education students vulnerable to the idiosyncrasies of regular education funding. In addition, he notes special education students often receive special education services in place of some regular education services that the excess cost formula does not take into account. Hartman has recommended the use of "supplemental/replacement" as a method that estimates the costs of actual special education services that replace regular education services for a special education student. This is consistent with the use of the ingredients approach supported

by Levin (1983), Rice (1997), and Levin and McEwan (2001). The "supplemental/replacement" approach could be applied to any situation in which a subgroup of the population is receiving special services.

As part of unpacking the costs of a program, it is important to identify the agency, institution, or individual that incurs the cost. On the surface (i.e., in a school's budget) a program could look quite inexpensive, but the state might have made large grants available and the program might be funded primarily from a grant. Similarly, costs for services such as an educational consultant might be shared among school districts or absorbed by a social services agency. In each of these cases, it is important to indicate who is bearing the cost and what portion is specific to the program(s) being studied. Not only does unpacking of costs allow one to determine the overall costs of a program, it also permits identification of all who are incurring costs and demonstrates the necessary support required if a program is to be transported to a new site.

Another consideration in understanding the costs associated with a particular program is its projected duration: Is it a one-year program or are multiple project years anticipated? Most educational programs and interventions are planned as multiyear and, therefore, the cost of the ingredients must be spread over time. Equipment, such as computers, purchased for a program should last more than one year and their costs need to be spread over their lifetime in the program. Similarly, the cost of facilities must be accounted for in the same way. It is important to spread these costs over the life of the program (annualization); otherwise, total first year costs could be inappropriately used as the basis for making decisions. The process of annualization takes account of both depreciation (replacement value divided by the life of the facility or equipment) and the cost (opportunity cost) of also having resources invested in the un-depreciated portion of the facility or equipment.

Two other cost adjustments, for inflation and discounting, need to be made for multiyear programs. To provide information about program costs that are adjusted for inflation involves using a rate of inflation, such as the consumer price index, for a designated year to calculate program costs for other years. Recent research by Chambers (1997a, 1997b) has resulted in the development of a cost of education index as a tool for measuring cost variations for school resources over time and across geographic regions. In addition to accounting for inflation, the costs of program ingredients must be adjusted for their time value. Delaying program expenditures temporarily frees up resources to be invested in alternatives, perhaps generating interest. To make comparisons between programs with different time patterns for purchasing ingredients requires discounting those ingredient costs to their present value using a discount rate of between 3 and 5 percent. Levin and McEwan (2001) have provided an excellent discussion of annualization, adjusting for price inflation, and discounting procedures, in the costing of a multiyear program; a more technical explanation can be found in Mishan (1976).

Strides clearly have been taken in the methodology of cost estimation in educational cost analysis. In reviewing the role of cost analysis in educational evaluation and policymaking, Tsang (1997) has drawn our attention to an additional dimension of cost estimation that relates to possible ethical or political problems. Tensions might arise because some stakeholders may be reluctant to face the true costs of an initiative or different stakeholders may wish to manipulate the results

of a cost analysis for their own purposes. Tsang notes that increased training and improved communication will contribute to the greater use of cost analysis in educational decision making; however, these political tensions probably will persist.

### *Analysis of Effects*

Heyns, writing in 1986, described the previous twenty years as "a prolonged dispute over the meaning and measurement of educational effects" (p. 305); these debates have continued for more than another decade as evaluators respond to the complex nature of schools as organizations. Traditional measures of school-based program effects include completion rates, student achievement on tests, reduction in the number of dropouts, and rates of high school graduation and college placement. However, programs may have other and multiple outcomes that require more sophisticated conceptualization and measurement techniques (Levin, 1988; Levin & McEwan, 2001; New York State Board of Regents, 1996). Time is also a factor in considering program effectiveness, as several years may be required before the full impact of a particular program can be measured (Rice, 1997). We turn next to a consideration of program effects within the context of cost analyses.

Evaluating the effectiveness of an intervention depends on the perspective and scope of the analysis. In their study of the benefits and costs of dropout prevention programs in 11 high school academies, Stem and his colleagues pointed to some mixed results in a comparison of the academic achievement of academy program students and matched, nonrandom control students (Stem, Dayton, Paik, & Weisberg, 1989). Academies are schools within schools providing academic and vocational training designed to prevent student dropout from school. While academy program students did not show higher academic achievement *than* did the control students, the academy program students had a higher rate of retention in high school than did the control students. Stem et al. argued for evaluating the cost-benefit of the academy program on the basis of graduation rates rather than academic achievement. This argument reflected a societal perspective, as high school graduates have stronger employment possibilities and, therefore, greater earning potential than high school dropouts. From society's perspective, high school graduates make a greater financial contribution than do high school dropouts. In a similar approach, Stiefel, Iatarola, Fruchter, and Berne (1998) advocated for evaluating costs of high schools with small, medium, and large student bodies on the basis of number of students graduated, instead of employing a cost per pupil measure.

Comparison of the impact on student learning of different program alternatives requires evidence that the desired outcomes can be produced by each program (Barnett, 1993) and that comparable measures of effectiveness are available in appropriate units (Popham, 1988). These objectives may be difficult to accomplish (Rice, 1997). In her comparison of three programs that targeted "at risk" students, King (1994) focused on costs, basing her final analysis on the assumption that each program was equally effective at reaching similar goals. However, King failed to provide any data supporting this assumption. Nevertheless, she recognized that additional information on program benefits should be integrated into the cost analysis.

Kennedy (1999) addressed the issue of the lack of consensus about agreed-upon indicators of student learning in the context of policy manipulations associated with school reform. She argued that, in particular, measures of "complex student learning" suffer from this lack of agreement. When indicators and outcomes of stu-

dent learning are poorly related, the extent to which reforms can be genuinely advocated and implemented is limited. As Levin (1988, 1995b) has noted, it is crucial in assessing educational effectiveness to understand what the decision problem is and how it originated. Selecting a program to foster higher standards of student achievement will require consensus about what counts as higher standards and what measurement tools are appropriate, such as standardized achievement tests or structured classroom observations. While the health and medical fields do not have complete consensus about the use of QALYs to assess the effects of an intervention, this measure was recommended for use in reference case studies (U.S. Department of Health and Human Services, 1996), and represents greater progress towards identifying and measuring outcome effects than is evident in the educational community.

In considering cost-effectiveness of educational programs, little attention has been directed to outcomes such as student satisfaction (Levin, 1988; Levin, 1995b; Levin & McEwan, 2001), improvements in self-esteem, or good citizenship (Rice, 1997), which may be more difficult to measure than achievement. Similarly, no attention has been paid to degree of teacher satisfaction with programs or interventions. A greater sense of professional satisfaction may improve teacher efficacy and, for some school systems, this may impact positively on the recruitment and retention of teachers. Alternatively, reliance on large amounts of "donated" teacher time may have negative effects on teacher efficacy with regard to a program's implementation. These may be secondary outcomes of a decision to adopt a particular program and need to be considered.

In summary, while attention has been paid in educational research and policy to cost analysis and evaluation of program effects, there are few studies that integrate these significant sources of information into either cost-benefit or cost-effectiveness analysis. The lack of an agreed upon protocol for such analyses in education limits the usefulness of the few existing studies to their primary audiences only. However, in the next section we closely examine four cost-effectiveness studies that hold promise as potential education reference cases and models for future application.

### **Models of Application**

In the following, we evaluate the strengths and weaknesses of four educational cost-effectiveness studies by using the practical steps suggested by Barnett (1993) and the protocol suggested by the PHS panel (U.S. Department of Health and Human Services, 1996). Evaluating these studies offers a way forward in developing models for future application. These studies address the cost-effectiveness of alternative teacher education programs (Denton & Smith, 1985), computer-assisted instruction (Levin, Glass, & Meister, 1987), alternative mathematics programs (Quinn et al., 1984), and early intervention services (Warfield, 1994). Although these studies have some methodological limitations and wide variations in sample size, they are notable for their attempts to thoroughly apply the principles of cost-effectiveness analysis. Table 2 summarizes important characteristics of these studies.

The four studies were selected based on the following criteria: (a) as a quality control measure, the study was published in a refereed education journal within the last 20 years; (b) to eliminate the difficulties in comparing educational inputs and outputs across differing international educational systems, the study was undertaken on a sample drawn from the United States; (c) the study compared educational

TABLE2  
Characteristics of four studies

Studies	Journal	U.S. Sample	Outcome/measure	Education program or intervention	Cost-effectiveness ratio <sup>a</sup>
Denton & Smith (1985)	<i>Educational Evaluation &amp; Policy Analysis</i>	Southwest USA	Cognitive gains of pupils taught by student teachers. Supervisor ratings of student teacher instructional skills. Student teacher morale.	Teacher education programs for education majors and non-majors.	Cost per student teacher/student teachers' pupils' learning gains.
Levin, Glass, & Meister (1987)	<i>Education Review</i>	National sample	Standard deviation units (effect sizes) on mathematics and reading tests.	Computer-assisted instruction. Cross-age tutoring. Reduced class size. Increased instructional time.	Achievement effect per \$100 cost per pupil.
Quinn, Van Mondfrans, & Worthen (1984)	<i>Educational Evaluation &amp; Policy Analysis</i>	Utah	Iowa Test of Basic Skills. Locally developed math achievement test. Level of math program implementation.	GEMS Proficiency Mathematics. Six published math textbooks.	Cost per pupil/Math achievement gain.
Warfield (1994)	<i>Educational Evaluation &amp; Policy Analysis</i>	Massachusetts	Nursing Child Assessment Scales. Vineland Adaptive Behavior Scales.	Federally mandated individualized family service plan for infants and toddlers with developmental disabilities or delays.	Developmental charge per \$1,000 worth of services per infant and toddler sub group.

<sup>a</sup>Levin, Glass, and Meister (1987) and Warfield (1994) use E/C ratio. Denton and Smith (1985) and Quinn, Van Mondfrans, and Worthen (1984) use C/E ratio.

*State of Cost-Benefit and Cost-Effectiveness Analysis:*  
programs or interventions that could be replicated; (d) the outcomes measured included student achievement and/or cognitive or psychological development; and, (e) results were presented as a cost-effectiveness or effectiveness-cost ratio.

Applying these criteria resulted in the exclusion of some studies that might otherwise be included in a discussion such as this. For example, Hartman and Fay (1996), in their examination of the cost-effectiveness of instructional support teams for students with special learning needs, included a cost comparison ratio to traditional referral and placement services, but did not include measures of student achievement or abilities. Consequently, the study results did not include a cost-effectiveness ratio. Similarly, Eisenman, McCoun, and Escobar (1990), in their comparison of two alternative models for serving speech-disordered preschoolers, did not include a cost-effectiveness ratio that incorporated both costs and achievement measures. Thus while these two studies, and others, had strong features, they were excluded because they failed to meet our criteria.

The perspective or scope of the analysis undertaken in the four selected education studies ranged from that of a particular college of education (Denton & Smith, 1985), to a particular school district (Quinn et al., 1984), to state level policy on early intervention in Massachusetts (Warfield, 1994). Levin, Glass, and Meister's (1987) study of computer-assisted instruction was concerned with the educational productivity of schools from an educational policy perspective. This study comes closest to adopting the societal perspective advocated by the PHS panel (U.S. Department of Health and Human Services, 1996) for cost analyses in health and medicine. The panel justified this societal perspective on ethical grounds in that this perspective represents the public interest rather than the interests of particular institutions or stakeholders.

In determining program costs, these education studies encountered many of the problems in providing a comprehensive cost analysis as discussed earlier. For example, Warfield's (1994) study of early intervention services failed to include the opportunity cost of parent time necessary for attending a weekly parent group meeting that was part of the services. Denton and Smith (1985), in comparing two different undergraduate teacher education programs, did not address costs to students for taking additional courses required by one of these programs. Neither did they consider the extent to which either of the programs was more costly in terms of school principal or co-operating teacher time in supervising the students' school-based teaching experiences. It appears that both the Warfield and the Denton and Smith studies confused budgeted expenditures with actual program costs (Monk, 1995). In comparing computer-assisted instruction with other interventions designed to increase students' reading and math achievement, Levin et al. (1987) relied on national cost figures that can make extrapolation to local conditions more difficult. However, Levin et al., along with Quinn et al. (1984) in their study of two math programs, used the more comprehensive ingredients approach for cost analysis (Levin, 1983; Levin & McEwan, 2001).

The PHS panel report (U.S. Department of Health and Human Services, 1996) raised an additional cost issue not addressed by these four studies, that is, the extent to which future costs may be increased by a health intervention. For example, one medical problem could be alleviated in an individual, thus prolonging his or her life, but additional medical costs could be incurred due to further health problems unrelated to the initial medical problem. Similarly an educational intervention that

*Hummel-Rossi and Ashdown*

leads to improved math and reading achievement may mean students take more advanced course work in the future than they might otherwise have done. This advanced course work might be more costly to provide. This was exactly the situation in the Perry Preschool study (Barnett, 1985), in which the children in the preschool intervention took more advanced schooling than did the children in the control group. Barnett demonstrated that these additional costs were offset by increased earnings in adulthood.

In making decisions about which programs to compare in undertaking cost-effectiveness analysis, there should be evidence that all programs compared produce the desired outcome(s). There is little point in analyzing costs or evaluating whether an ineffective program is cost-effective if target outcomes are not produced (Barnett, 1993). The PHS panel report (U.S. Department of Health and Human Services, 1996) recommended comparing existing practice with an alternative intervention. All four education studies under discussion here compared alternative programs that had evidence of producing desired outcomes. However, a rationale was not always provided for selecting these alternatives. For example, Levin et al. (1987) situated their study in the context of educational reform and compared computer-assisted instruction with three other program interventions (peer tutoring, reduced class size, and increased length of school day), but did not use regular classroom instruction as a control. This study had an implicit assumption that regular classroom instruction needed to be supplemented. Cost studies need to be explicit in articulating clearly the rationale for comparing alternatives and the relation between alternative programs and usual practice.

In designing evaluations of program cost-effectiveness, Barnett (1993) recommended true experimental designs. The PHS panel report (U.S. Department of Health and Human Services, 1996) drew on the tradition of randomized clinical trials in health and medicine for its recommendations, recognizing also that observational data and uncontrolled experiments may be appropriate at times. None of the education studies under consideration here used a true experimental design. However, this is typical of educational research, in which it is difficult to construct true experimental and control groups because of ethical issues of withholding treatment, and practical issues of being able to assign students to interventions, and being able to compare alternative programs simultaneously in one study. Denton and Smith (1985) used "natural comparison groups" (p. 198) in that two alternative teacher education programs were available for study within the same institution. From our viewpoint, the most interesting evaluation design is that of Levin et al. (1987), in which representative experimental and quasi-experimental studies of each intervention were used, and student achievement data were converted into standard deviation units to provide effect sizes as a comparable measure of program effectiveness across different programs using different outcome measures.

As described earlier, the development of a measurement convention called quality-adjusted life years (QALYs), as a standard measure in the fields of health and medicine, offers a basis for combining qualitative and quantitative effects of health and/or medical interventions. No such measure has been established in the field of education and this is reflected in the four education studies discussed here. Varying outcome measures are used in the studies, including the Iowa Test of Basic Skills (Quinn et al., 1984), Vineland Adaptive Behavior Scales (Warfield, 1994),

standardized achievement test scores converted to a common outcome measure (Levin et al., 1987), and student cognitive gains on a curriculum unit test (Denton & Smith, 1985). With the exception of the Denton and Smith study, the use of standardized instruments in the other three studies more easily permits comparison and replication in future studies.

All of the four education studies are limited in their efforts to evaluate outcomes that are not easily measured and/or are qualitative in nature (Barnett, 1993). For example, Quinn et al. (1984) compared the cost-effectiveness of two mathematics programs. One program was particularly successful at raising the mathematics achievement levels of low SES children. It is possible that there were residual effects from improved academic achievement in math, such as improvement in other subject areas, in student behavior, in student attendance, and in student self-esteem, but these residual effects were not included for measurement in the evaluation. However, Denton and Smith (1985), in their comparison of two teacher education programs, did measure possible changes in the morale of students as a consequence of participating in each program.

None of these four cost-effectiveness studies addressed the issue of potential "harms" as program effects, something the health panel report (U.S. Department of Health and Human Services, 1996) advocated examining. For example, a medical intervention that fails to alleviate a medical condition can be viewed as harmful to the individual. However, educational research rarely considers harm as an educational outcome. An educational program that does not produce a positive outcome is generally not seen as harmful, just ineffective. Quinn et al. (1984) approached this issue tentatively as they analyzed the interaction of the two different math programs' levels of implementation and students' SES on outcome measures. It appeared that the more traditional text-based math program had little or no positive impact on the achievement scores of low SES students. When the students' math scores were corrected for guessing, low SES students' scores decreased, resulting in a negative cost-effectiveness ratio. Thus the ineffectiveness of the program could be seen as harmful to the low SES students' achievement.

As each of the studies under consideration addressed one year of operation, no discounting procedures were used. Unfortunately examination of any long-term effects was limited by this short time period. For example, the comparison of two teacher education programs (Denton & Smith, 1985) did not consider whether there were any differences in employment opportunities as a result of each program when the students had completed their course work.

Once a cost-effectiveness analysis is completed, Barnett (1993) cautioned that a final decision about adopting a particular program might require further information about, for example, scale of operation and variations in populations served. Distributional consequences of an intervention are important to consider and require attention to more than just economic efficiency. Identifying who gains and who loses involves considering broader societal values, which could also be addressed by conducting a sensitivity analysis to check the underlying assumptions on which the study was based. Quinn et al.'s (1984) study addressed the extent to which math instruction in two different programs benefited children across socioeconomic groups. In addition, the researchers included a thorough sensitivity analysis of three key assumptions of the study and how changes in these assumptions would change the cost-effectiveness ratio of each program. Similarly, Warfield's (1994)



intervention study used children with specific developmental delays from middle-class families and this researcher cautioned that the results could not be generalized to other developmental delays or to low-income groups. In summary, while none of these studies meets the criteria of a reference case as defined by the PHS panel (U.S. Department of Health and Human Services, 1996), taken together they provide the foundation from which to develop further studies.

### Recommended Cost-Effectiveness Protocol for Educational Research

Given the current state of economic evaluation in education, what direction should educational researchers take in furthering the development and use of cost-effectiveness analysis in educational research and evaluation? Considering the strengths and weaknesses of the four studies just reviewed and drawing upon the recommendations from Barnett (1993), the PHS panel (U.S. Department of Health and Human Services, 1996), and Levin and McEwan's work (2001), we make several recommendations for conducting cost-effectiveness evaluations within the field of education, in particular at the school level. These recommendations are discussed below and summarized in Table 3.

Considering first the Perspective of the analysis, we recommend that it be focused on those goals of the evaluation that are clearly articulated and for which there is consensus. Taking a societal perspective, while most desirable, may complicate the identification and measurement of program inputs and outputs. As cost-effectiveness

TABLE 3  
Recommended protocol for cost-effectiveness studies in education

Component	Recommendation
<i>Perspective</i>	Goals of the evaluation that are clearly articulated.
<i>Cost Analysis</i>	Ingredients approach.
<i>Comparators</i>	Existing practice or reasonable alternatives.
<i>Estimate Program Effects</i>	Rigorous experimental or quasi-experimental design with attention to identifying hidden and/or qualitative outcomes, and positive as well as negative outcomes.
<i>Outcome Measures</i>	Standardized achievement measures or effect size, if different achievement tests used. Attempt to measure qualitative residual.
<i>Distributional Consequences</i>	Assign all types of costs and effects to appropriate parties.
<i>Analysis of Time Effects</i>	Annualize costs, take into account inflation, and discount costs over time.
<i>Sensitivity Analysis</i>	Explore variations in significant assumptions/parameters and identify their impact on cost-effectiveness ratio.
<i>Decision Rule</i>	Cost analysis is an important source of information in decision-making, but not sole criterion.
<i>Reporting of Findings</i>	Need for a technical report that includes a reference case and that is available upon request. Results also reported in professional journal.

Note. Adapted from Barnett (1993) and U.S. Department of Health and Human Services (1996)

has had limited application in education heretofore, recommending a more complex analysis may be a disincentive. Further, given the current political climate surrounding education, one can be most objective by targeting those goals agreed upon by the educational community associated with the school. The partisan agenda of interested stakeholders may limit or distort the parameters of an evaluation and the evaluator should attempt to distance him/herself from these agenda.

For gathering cost information (Cost Analysis) and identifying their sources, an ingredients approach as originally advocated by Levin (1983) is recommended. This is an inclusive method that helps to identify hidden as well as obvious costs. It is consistent with current thinking about resource-based approaches for costing educational services (Chambers, 1999).

Cost-effectiveness analysis is an aid in decision making about resource allocations and, therefore, requires that there be alternative programs for comparison (Comparators). The easiest comparisons to make at the school level are with existing programs. Reasonable alternatives should also be considered. For example, comparators for literacy programs serving students at risk for literacy problems might include classroom instruction, small group instruction, one-to-one tutoring, grade retention, and special education placement.

To estimate Program Effects, we advocate employing as rigorous an experimental design as the setting will allow. This implies a good sampling plan, use of randomized control groups, if possible, or carefully constructed control groups, and appropriate statistical analyses. The design should be sensitive to anticipating any negative effects of a program as well as to anticipating positive effects. At the school level it is often difficult to conduct a "true" experiment. Practical constraints, such as small sample size, and ethical considerations, such as withholding of services, impact efforts to accurately estimate program effects. The evaluator should be conversant with a variety of methodologies, such as nonparametric statistics, so as to be able to address these design problems. For example, we advocate the use of interviews and focus groups to attempt to identify those outcomes that might otherwise be overlooked and may be difficult to quantify (qualitative residual). We recognize the associated measurement problems, but that should not deter us from investigating these areas.

The selection of Outcome Measures is critical. We recommend that the outcome measures include, but not be limited to, psychometrically sound standardized tests. This provides for the comparison with alternative programs. Levin et al. (1987) demonstrated how effect size could be used to make economic comparisons among programs when different standardized tests had been used. This is a promising solution to current barriers to comparison. Outcome measures also should include attempts to evaluate the qualitative residual.

To be useful, a cost-effectiveness analysis must address Distributional Consequences and assign all costs and effects to appropriate parties. All the costs must be transparent so that comparisons may accurately be made among competing programs and at different school settings. For example, in some school communities, contributed costs such as parental time may not be feasible. As a second example, outside funding may contribute to a significant portion of program costs, but if this funding becomes unavailable, funds will have to come from another source to maintain the program's implementation. In addition, attention should be paid to the distribution of effects. For example, a literacy intervention may improve a



child's academic performance such that the amount of time the child's parents spend on assistance with homework is reduced.

Although school budgets typically are created on an annual basis, school programs are usually planned for a multiyear operation and time effects on costs and outcomes must be analyzed (Analysis of Time Effects). There are three important accounting adjustments that should be undertaken when conducting a cost-effectiveness analysis of a multiyear program. These are annualization, discounting, and inflation adjustment. Initial investments in program facilities and equipment may be high and must be distributed over the life of a program (annualization). In addition, expenditures that can be deferred to the future are less of a financial burden as the money can draw interest until needed (discounting). Finally, in a multiyear program the costs for materials, salaries, and services must be adjusted for inflation. Therefore, in accord with Barnett (1993), the PHS panel (U.S. Department of Health and Human Services, 1996), and Levin and McEwan (2001), we recommend including these accounting adjustments. Levin and McEwan's work is a good resource on annualization of the costs of facilities and equipment, discounting future costs to present value, and adjusting for inflation.

Sensitivity Analysis checks the robustness of the conclusions by asking if the appropriate dimensions of the variables have been examined and how changes in these dimensions would impact the conclusions from the cost-effectiveness analysis. For example, a sensitivity analysis could address the issue of whether a program could be implemented as cost-effectively in another school setting in which the characteristics of the children differ. Or a sensitivity analysis could determine changes in the cost-effectiveness ratio as the number of children served by a program changed.

Cost analysis is an important source of information in decision making; however, it should not be the sole criterion for the decision. It is easy to allow a number (e.g., cost-effectiveness ratio) to take on more importance than it is worth in decision making. In educational decision making the cost-effectiveness ratio must be considered in the context of other important variables. For example, societal values, such as equal opportunity for learning and developing high student self-esteem, may not always be consistent with economic efficiency and, consequently, these values must be weighed against costs.

It is imperative that results be reported (Reporting of Findings) in such a manner so as to be useful to the cost-effectiveness analyst, as well as the general educational community. In reporting findings, we recommend that both a technical report and a published article in a refereed professional journal be written. If these recommendations are followed, the technical report will serve as a reference case and the educational community thus can begin to build its own industry-standard of cost-effectiveness analyses. The journal article will serve to inform the professional community of cost-effective program options. To encourage the use of this protocol in cost-effectiveness analysis in education, we consider next the attractions and incentives for education policymakers in the application of this protocol.

### Implications for the Application of a Cost-Effectiveness Protocol

Establishing a protocol for cost-effectiveness analyses in educational evaluations is a step forward in overcoming problems that have restricted the method's use in the past. However, it does not guarantee greater use of this analytic tool in

the future. Attention needs to be paid to the attractions cost-effectiveness analysis holds for policymakers, and to the role of incentives in encouraging its use as an evaluation tool. A number of important education policy areas would appear to benefit from a methodologically more rigorous approach to the evaluation of costs and effects and provide motivation for the application of cost-effectiveness analysis. Three policy areas are addressed briefly here: the politicization of education decision making, the role of increased education expenditure in relation to student achievement, and school finance litigation.

In discussing cost analysis, Tsang (1997) raised political issues that could impact motivation to pursue analyses. Within a limited resource environment some education stakeholders may be enthusiastic about cost-effectiveness analysis if they anticipate that it will result in the demise of one program in favor of another that they prefer. The New York State Board of Regents report (1996) alluded to this danger and cautioned that cost-effectiveness analysis is not a cost-cutting or cost-reduction tool. The protocol described earlier includes protections from this danger by ensuring that a cost-effectiveness analysis includes program comparators and that the outcomes of the evaluation are placed within a broader decision-making framework. A cost-effectiveness analysis should not be the sole basis for program decision making.

Appropriate incentives to conduct genuine cost-effectiveness analyses also could assist in addressing the politically motivated environment in which education programs are conducted. One of the six recommendations for improving cost-effectiveness in education to emerge from the New York State Board of Regents report (1996) addressed the specific need for incentives by arguing for experimentation appropriate to the public sector. This recommendation included that schools that implement cost-effective practices should benefit from the resulting savings. The report also recommended competitive grants for districts wanting to try out particular innovations that have potential to be cost-effective. The grant would support planning and evaluation activities for the innovation and, later, broad dissemination of the results regardless of the outcome. This emphasis on fiscal support for innovation appears particularly promising in addressing the current lack of opportunities experienced by school districts for evaluating several educational programs and interventions simultaneously.

As the preceding discussion suggests, the issue of incentives to conduct cost-effectiveness analysis is situated within a larger debate about "does money matter" in securing educational achievement for all students (Hanushek, 1994; Wedges, Laine, & Greenwald, 1994). Historically, a skeptical policy environment reflected a lack of confidence in schools' abilities to transfer to students the benefit of additional expenditures (Hanushek, 1994, 1996) and provided little incentive for the use of any kind of cost analysis in program decision making. Recent research evidence (Greenwald, Hedges, & Laine, 1996; Versteegen & King, 1998) confirming a positive relation between money spent in education and student achievement may provoke greater interest in cost-effectiveness analysis. There is evidence that some policy variables can make a difference in terms of student achievement; examples of such variables are administrative arrangements like smaller classes, increased financial allocations like per pupil expenditure, and teacher characteristics such as teacher education and years of experience (Greenwald et al., 1996). Given this evidence, more attention needs to be paid to *how* such variables are

configured in the delivery of education to students. Cost-effectiveness analysis could contribute to comparisons of different programmatic and administrative arrangements and in evaluating their effectiveness. We must caution, however, that there is not necessarily a linear relation between increased dollars spent and student achievement units gained. Often there are basic amounts of money that must be spent to achieve minimal educational objectives and there are ceiling effects in terms of student achievement. As an example of the need for minimal expenditure, students cannot undertake science experiments without an appropriately equipped laboratory.

School finance litigation also may act as an incentive for educational researchers and stakeholders to turn to cost analysis tools. Since the 1960s there has been a series of legal challenges to the education finance system of a number of states alleging violations to both the U.S. Constitution and state constitutions with regard to adequacy and equity of education provision (Girder & Versteegen, 2000; Thro, 1990; Versteegen, 1994). States have been challenged in court to reform their education finance systems to achieve equity in the allocation of economic resources to schools as well as to ensure adequacy of resources to schools, such as qualified teachers, up-to-date textbooks and sufficiency of resources for students with special needs. Where states have to change financial aid formulae to comply with legal mandates, cost-effectiveness analysis may be a useful tool in resource allocation decision making, particularly if a court ruling is not accompanied by an increase in funds for state education budgets (Sweetland, 2000).

### Conclusions

From our review of the medical, health, and human services literature, we have learned valuable lessons from fields other than education about cost-effectiveness analyses that we can apply to education. In the following we summarize these lessons learned and indicate where the education field stands with respect to them. These lessons relate to the process of rational decision making, the consideration of education programs as service delivery systems, the importance of a societal perspective, the value of broadening the measurement framework, and the need for reference cases.

The health and medical fields have shown that cost-effectiveness analyses can provide useful data for policy decision making (Buerhaus, 1998) and that without these analyses, decisions are in danger of being based on emotional appeal, political pressure, absolute intervention costs, and "first-come-first-served" (Siegel, 1998). Education has a parallel situation. For both mandated and non-mandated educational services, decisions must be made about which programs to select and implement. Often choices must be made among varying programmatic goals, e.g., programs for gifted and talented, sports programs, or music and arts programs. Although there exists a vast educational service delivery system in the United States, educational funds are always limited, and program decisions may be driven by the previously cited pressures. Educators could take the lead from the health and medical fields and enhance the process of decision making by providing policymakers with objective data that help them weigh the trade-offs inherent in the decisions that must be made in education. Levin (1983), and more recently Levin and McEwan (2001), Monk and King (1993), and Rice (1997) have taken the initiative in the field of education in advocating and in developing methodologies for cost-

effectiveness analyses. Application of the protocol described herein contributes a conceptual framework and a practical tool for accomplishing this.

While, on the surface, the human services, health, and medical fields might appear quite different from education, thus requiring different strategies for cost-effectiveness analyses, closer inspection reveals many similarities or parallels. First and foremost, all are service delivery systems. If a particular service delivery model can be examined through cost-effectiveness analyses in human services, health, and medicine, then one should investigate whether it could also be examined through cost-effectiveness analyses in education. Health and medicine operate within complex institutional boundaries that represent public or private hospitals and their catchment areas, and private or public health insurance providers. Human services boundaries usually are defined by geographic area, income level, and private or government funding. Similar to human services and health and medicine, schools are differentiated by public or private funding and boundaries are defined geographically by school districts and catchment areas. Federal and state rulings closely regulate human services, health, medicine, and education. Within the field of education, Chambers (1999) has argued that individual service delivery systems, e.g., a literacy pullout program, should be the unit of analysis in examining cost and resource allocations. By so doing, Chambers has demonstrated how it is possible to track the full range of linkages between costs, students served, and outcomes and, thus, trace the impact of a particular education program.

Underlying the cost-effectiveness work in human services, health, and medicine is a societal perspective that recognizes everyone involved or impacted by a program, and all costs and effects. The PHS panel (U.S. Department of Health and Human Services, 1996) recommended a societal perspective as the most ethical perspective for conducting cost-effectiveness analyses. Such a perspective protects against the exclusion of certain costs or effects (e.g., volunteer time and negative outcomes for some participants), and protects against the bias in individuals or institutions making decisions from which they are likely to gain. By implication, taking a societal perspective means expanding the boundaries of time, geographic location, costs, and effects. The four education cost-effectiveness studies reviewed herein (Denton & Smith, 1985; Levin, Glass, & Meister, 1987; Quinn et al., 1984; Warfield, 1994) have, for the most part, limited boundaries in all of these areas, reflecting the rudimentary state of cost-effectiveness analyses in education as compared with health and medical research.

Another lesson learned from a review of the human services, health, and medical fields relates to the value of using a broad measurement framework for cost-effectiveness analysis. The measurements used must be designed to assess the full range of costs and effects. The PNS panel (U.S. Department of Health and Human Services, 1996) recommended inclusion of a standard outcome measure, quality-adjusted life years (QALYs), in all cost-effectiveness analyses to allow for comparison among studies. This index of both quantitative and qualitative outcomes represents an improvement on an earlier measure that simply accounted for number of years of life gained. It could be argued that education has a similar metric in standardized achievement tests. However, achievement tests differ in content and scoring and they are usually used in program evaluation as a one-time, narrow assessment of cognitive gain.

Barnett (1993) has addressed the importance of not limiting outcome measurement to the major stated program goals and of including measurement tools designed to capture unanticipated outcomes, which he described as the "qualitative residual." The education literature has revealed an understanding of this need. Verstegen and King (1998) have stressed that by taking an inductive, rather than deductive measurement approach to education production, a wider range of outcome variables are examined. Moreover, by following this approach, many of the variables are measured longitudinally. Also arguing for a broader measurement framework, Monk and King (1993) presented a case for uncovering all hidden costs.

The PHS panel (U.S. Department of Health and Human Services, 1996) stressed the importance that all cost-effectiveness studies conduct a core analysis (reference case) that complied with their recommended methodology. By conforming to prescribed methodological standards, the reference case permits the comparison among studies of different interventions conducted with different populations, in different settings. Barnett (1993) has suggested a useful schema for conducting economic analyses in the human services field, and Levin (1983) and Levin and McEwan (2001) have provided useful methodology for conducting cost-effectiveness analyses. But to date, in the field of educational research, there have been no recommendations for a core analysis or reference case. The protocol described in this article and summarized in Table 3 includes a reference case component and provides such a recommendation.

We contend that our cost-effectiveness protocol has promise for furthering educational research and, thereby, for contributing to more informed public debates about educational policy and resource allocation. It draws on work from the fields of human services, health, and medicine that has not been scrutinized for its usefulness in terms of education. It also takes from previously conducted educational studies that have not been drawn on significantly as models for further research. We believe that this protocol has potential for application at many levels within education and could be a valuable tool in educational decision making.

We recognize that the recommended protocol and the use of cost-effectiveness studies need to be situated within larger debates about the efficiency and effectiveness of schools as organizations (Levin, 1997) in improving student learning and achievement (Harter, 1999). The New York State Board of Regents (1996) drew attention to the fact that these debates are not served well by a lack of distinction between cost-effectiveness and "cost cutting." In addition, according to Alexander (1998), educational researchers are not helped by measurement confusions and imprecise research designs that leave programs vulnerable to political whim. We, therefore, see such a protocol contributing to greater rigor and clarity in the conduct of future cost-effectiveness studies.

#### Note

<sup>1</sup>There is substantial research literature within education production function studies that addresses the role of production function in policymaking (Monk, 1989).

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## Applications of Social Capital in Educational Literature: A Critical Synthesis

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*This critical synthesis incorporates both theoretical and empirical literature on social capital since its original conceptualization by Bourdieu (1986) and Coleman (1988) in the late 1980s. The focus of the review is on educational literature that studies social capital and educational outcomes. After outlining their approach, the authors briefly trace the intellectual history of the concept and its transport to the field of education. Next, they undertake a critical review of the literature by first examining trends in conceptualization, methods, and outcomes and then assessing empirical support for claims that social capital is positively linked to educational and psychosocial outcomes. Finally, they discuss gaps in the conceptualization, measurement, and analysis of social capital in educational literature.*

**KEYWORDS:** *educational research, literature reviews, social capital.*

There is a growing body of literature on social capital and its relationship to educational development. Interest in the concept was stimulated largely by the work of James Coleman and Pierre Bourdieu in the late 1980s. Social capital is one of sociology's most popular theoretical exports, and although some have argued that the concept is a fad among those looking for a quick-fix solution to social and economic problems, the concept has captured the attention of educational researchers and policymakers aiming to improve America's schools. While interest in and use of the concept has increased, a critical review and synthesis of the research literature on social capital in education is notably absent. Such an integrative review would serve to shed light on the theoretical frameworks, methodological approaches, and implications of research over the past decade, as well as illuminate gaps and inconsistencies.

This critical synthesis explores the usage of social capital as an explanatory variable in educational research, drawing on theoretical literature in sociology and economics, and empirical literature in education and family/child studies. The article is divided into four sections. In the first section, the approach guiding this synthesis is outlined. A description of the intellectual history of the concept of social capital and its transport to the field of education provides the framework for the review of empirical literature in the second section. The third section is comprised of a critical review of the literature to understand the effects of the accumulation and exchange of social capital on educational and psychosocial outcomes for school-aged children and youth. The review first examines trends in conceptu-

## AGENDA SUMMARY SHEET

**AGENDA ITEM:** Advertising Update

**MEETING DATE:** October 14, 2002

**DEPARTMENT:** Business

**TITLE & BRIEF DESCRIPTION:** Advertising Update – An update on matters related to advertising within the District.

**ACTION DESIRED:** Approval \_\_\_\_ Discussion \_\_\_\_ Information Only   x  

**BACKGROUND:** Background information is contained in the procedures attached.

**OPTIONS AND ALTERNATIVES:** n/a

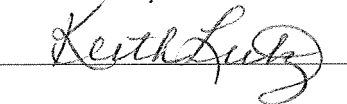
**RECOMMENDATION:** n/a

**STRATEGIC PLAN REFERENCE:** n/a

**IMPLICATIONS OF ADOPTION/REJECTION:** n/a

**TIMELINE:** n/a

**RESPONSIBLE PERSON:** Ken Fossen (Assoc. Supt.) and Amy Friedman (Dir. of Comm.)

**SUPERINTENDENT'S APPROVAL:** 



### **ADVERTISING PROCEDURES**

- **Procedures – Advertising Procedures**
- **Policy 1115 – Advertising**
- **Rule 1115.1 – Advertising**
- **Form – Advertising Agreement**

Issued October, 2002

## MILLARD PUBLIC SCHOOLS

### ADVERTISING PROCEDURES

#### 1.0 Background

- 1.1 On January 7, 2002, the Board of Education amended Policy 1115 and Rule 1115.1 to expand advertising opportunities in the District.
- 1.1.1 Under Revised Rule 1115.1, commercial advertising was made available in or on:
- 1.1.1.1 District owned athletic facilities – including Buell Stadium, football fields, baseball fields, soccer fields, softball fields, tennis courts, gymnasiums, and swimming pools.
  - 1.1.1.2 District-wide publications or District-sponsored projects.
  - 1.1.1.3 School-related publications, newspapers, yearbooks, newsletters, activity programs, and school event programs.
- 1.1.2 Policy 1115 provided that all advertising would be subject to applicable law including "applicable city ordinances."
- 1.1.2.1 Subsequent to the adoption of Rule 1115.1, the City of Omaha's Zoning Board of Appeals ruled against the District and precluded advertising on signs (or banners) which are "visible from a public right-of-way, private way, or court or from a property other than that on which the sign is installed." Such ruling effectively precluded all advertising on school grounds and the exterior of school buildings.
  - 1.1.2.2 Advertising on the interior of school buildings is not governed by the Zoning Board of Appeals. Therefore, advertising under Rule 1115.1 is still permissible in gymnasiums and swimming pools.

#### 2.0 Advertising on District-Owned Facilities

- 2.1 In light of the above, no commercial advertising is permitted the exterior of school buildings or on school grounds including, but not limited to, Buell Stadium, baseball fields, football fields, soccer fields, tracks, exterior scoreboards, and fences.
- 2.2 The only approved locations for commercial advertising on District-owned facilities are gymnasiums and swimming pools. Advertising on such facilities shall be subject to the following:
- 2.2.1 The building principal (or designee) shall determine the size and location of any advertising to be permitted in the building.
  - 2.2.2 The specifications and annual advertising fee for all advertising signs (other than banners discussed hereinbelow) shall be at the discretion of the building principal (or designee).
  - 2.2.3 The annual fee for advertising banners in high schools shall be as follows:
    - 2.2.3.1 Banner Size 3'x 5' = \$ 500/yr.
    - 2.2.3.2 Banner Size 3'x 8' = \$ 800/yr.
    - 2.2.3.3 Banner Size 4'x 6' = \$ 800/yr.
    - 2.2.3.4 Banner Size 4'x 8' = \$ 1,000/yr.
  - 2.2.4 The building principal (or designee) may make provisions for multiple year advertising arrangements. Such arrangements shall not exceed four years in length.



- 2.2.5 The availability of advertising opportunities shall be made known to PAYBAC partners. The building principal (or designee) may grant such partners a priority for such advertising if he/she should so choose.
- 2.2.6 All advertising banners shall (unless specifically approved otherwise in writing by the advertiser and building principal or designee):
  - 2.2.6.1 Be constructed of 14 oz. (or heavier) nylon-reinforced vinyl.
  - 2.2.6.2 Have grommets on the top and a pole pocket on the bottom.
  - 2.2.6.3 Meet any other specifications determined to be necessary or desirable by the building principal (or designee).
- 2.2.7 For purposes of consistency, all advertising banners shall be purchased and installed by the District. The advertiser shall reimburse the District for the cost of the banner plus \$25 for installation.
- 2.2.8 The design and content of the advertising shall be at the discretion of the advertiser, shall be subject to approval by the building principal, and comply with all District policies, including, but not limited to, Policy 1115 and Rule 1115.1.
- 2.2.9 No advertising for soft drinks or other products will be accepted which conflicts with the District's exclusive soft drink vending contract. Such contract is currently with the Coca-Cola Bottling Company.

### **3.0 District Publications and Projects**

- 3.1 All commercial advertising in District-wide publications and District-sponsored projects shall be administered by the District Director of Communications and shall be in accordance with applicable District policies and rules including, but not necessarily limited to, Policy 1115 and Rule 1115.1.

### **4.0 School Publications**

- 4.1 All commercial advertising in school publications (i.e., newspapers, yearbooks, newsletters, activity programs, and school event programs) shall be administered by the building principal (or designee) and shall be in accordance with applicable District policies and rules including, but not necessarily limited to, Policy 6605 and Rule 6605.1.

Effective: October 1, 2002

**Community  
Advertising****1115**

The facilities, staff and students shall not be involved in advertising or promoting the interests of any political or commercial interest or interests during school hours or during school functions except as approved by the Board of Education or the Office of the Superintendent as hereinafter provided in Rule 1115.1.

The District may permit advertising in recognition of contributions supporting the District and/or student activities. Such advertising or recognition shall be limited to areas and locations approved in accordance with the District Policies, Rules, state statutes and applicable regulations, and applicable city ordinances.

Related Rule: [1115R1](#)

Policy Adopted: June 6, 1977

Revised: January 7, 2002

Millard Public Schools

Omaha, NE

## **Community Advertising**

**1115.1**

The District may use educational materials bearing identification of the persons, firms, corporations or other business associations responsible for producing the educational materials provided such materials are used solely because of a bona fide educational value.

Commercial advertising and advertisements for the purpose of this Rule is defined to be commercial promotion, acknowledgments, recognition of persons, firms, corporations or other business associations or other commercial organizations for promotion of products or services.

All commercial advertisements must comply with the District's policies and rules. The acknowledgments, recognition or advertising shall not interfere with nor disrupt the operation of the schools, use of school facilities, school activities or the educational process.

### **I. Standards**

- A. The District does not by this rule create or establish an open or public forum and reserves the sole and absolute right to determine the acceptable content of any and all such commercial advertising or advertisements within the District.
- B. The content of any commercial advertising must meet with prior approval from the Superintendent or designee.
- C. The commercial advertisements shall not contain statements or commercial messages which the District determines, in its sole discretion, is contrary to educational values, is vulgar, obscene, defamatory, discriminatory, religious, political or ideological or which relates to a controversial topic or viewpoint.
- D. Commercial advertising or advertisements shall not relate to a product or service, which the District determines, in its sole discretion, to be inappropriate or illegal for minors, or violates any provisions of this rule.
- E. No commercial message may relate to a product or service that the District determines, in its sole discretion, to be educationally controversial or promotes the indoctrination of ideological, political, religious, or social beliefs.

### **II. Venues or Locations**

- A. Commercial advertisements, with the exception of District owned athletic facilities are not permitted on the interior or exterior of the District's property including buildings or facilities. District owned athletic facilities where advertising is permitted includes the Buell Stadium, football fields, baseball fields, soccer fields, softball fields, tennis courts, gymnasiums and swimming pools.
- B. Commercial advertising may be permitted in District-wide publications or District sponsored projects.
- C. Commercial advertising may be permitted in school related publications, newspapers, yearbooks, newsletters, activity programs and school event programs.

### **III. Procedures**

- A. Schools shall advise their PAYBAC partners of all advertising opportunities and may grant a priority to the PAYBAC partners for such opportunities. Additional commercial advertising opportunities may be offered to PAYBAC partners as part of the PAYBAC Partner Program with the approval of the Superintendent's designee.
- B. The following shall apply to contracts for commercial advertising and the contracts shall be on District

approved contract forms.

1. Building principals or supervisors of facilities without approval of the Superintendent or designee may enter into contracts for commercial advertising for the building or facility under the principal's or supervisor's authority and responsibility if the contract does not require a payment exceeding \$1,000.00.
  2. Subject to the prior approval of the Superintendent or designee, building principals or supervisors of facilities may enter into contracts for commercial advertising for the building or facility under the principal's or supervisor's authority and responsibility if the contract requires payment exceeding \$1,000.00.
  3. Any contract providing for any payment exceeding \$10,000.00 shall be subject to the approval of the Board of Education.
  4. Any contract which may only be economically feasible if for an extended term such as contracts for gymnasium floors or other similar facilities shall be subject to the approval of the Board of Education.
  5. When a payment or donation is made in kind a fair and reasonable value of the donation or payment in kind shall be considered the amount of the payment received.
- C. All revenue received from commercial advertising or institutional support for which recognition is granted shall be deposited into the District activities accounts and distributed as directed by the Superintendent or designee.

Related Policy: 1115P and Rules: 1102.1, 130614145, 1306.114145.1, 1325.1, 5510, 5510.1, 6240, 6240.1

Rule Approved: February 17, 1975

Revised: January 7, 2002

Millard Public Schools

Omaha, NE

AGREEMENT

(Advertising)

THIS AGREEMENT is entered into by and between the Millard Public Schools, Omaha, Nebraska (hereinafter "the District") and the following business and/or individual (hereinafter "the Advertiser"):

Business/Individual: \_\_\_\_\_
Contact Person: \_\_\_\_\_
Street Address: \_\_\_\_\_
City/State/Zip Code: \_\_\_\_\_
Phone Number: \_\_\_\_\_

WHEREAS the Advertiser desires to place an advertisement in the school building and area noted below during the school year indicated:

School Building: \_\_\_\_\_
Area: \_\_\_\_\_
School Year: \_\_\_\_\_

WI-HEREAS the District is willing to permit such advertising subject to the following fees and charges and all other provisions of this Agreement:

Advertising Fee: \$ \_\_\_\_\_
Banner Purchase: \$ \_\_\_\_\_
Installation Charge (\$25): \$ \_\_\_\_\_
Other Charges: \$ \_\_\_\_\_
Total Fees & Charges: \$ \_\_\_\_\_

NOW THEREFORE, it is agreed by and between the parties as follows:

- 1. That the District will permit the advertisement noted above to be installed in the building and area noted;
2. That the Building administration shall determine the specific location with such area where said advertising will be displayed;
3. That the Advertiser will pay the District the fees and charges noted above;
4. That school year shall commence on July 1st and end on June 30th.
5. That no partial-year reductions shall be made to the fees and charges unless specifically provided for in writing under "Other Provisions" hereinbelow;
6. That the design and content of the advertisement shall be at the discretion of the Advertiser, shall be consistent with all District policies and rules (including, but not limited to, Policy 1115 and Rule 1115.1), and shall be subject to approval by the District's administration;
7. That the advertising banner shall be purchased through the District and shall meet all District specifications;
8. That the "Banner Purchase" cost noted above is an estimated cost and that an additional charge (or credit) may be made when the actual cost of such banner is determined;
9. That this Agreement may be terminated by the District at any time for any reason; and, that if such shall occur, the District shall prorate the advertising fee over a twelve month period and refund the balance of such fee to the Advertiser; and,
10. Other Provisions: (specify)

IN WITNESS WHEREOF the parties set their hands this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

THE ADVERTISER:

THE DISTRICT:

Signature of Advertiser

Signature of Building Principal (or Designee)