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*Cost-effectiveness analyses, especially in education, are too rare. Yet they offer powerful and valuable insights for evaluators and can provide information that is counter to common sense, popular appeal, and traditional ideas.*

## Waiting for Godot: Cost-Effectiveness Analysis in Education

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For more than thirty years I have been applying cost-effectiveness and cost-benefit analysis to education. When I began this work in about 1970, there were almost no cost-effectiveness studies reported in the literature, and the term was not found in education at all. The term *cost-effectiveness* is now commonly used in justifying specific educational interventions. It has also become standard parlance among educational policymakers and decision makers.

Ostensible concerns for cost-effectiveness in education are not surprising. The educational sector of the United States is second in size only to the health care sector in terms of its drain on national resources. It is considerably larger than the military sector. When one includes formal education and the various forms of training, it has been estimated that about 10 percent of the gross domestic product—about three-quarters of a trillion dollars in 1998—is allocated to education, encompassing formal education and various forms of training (Merrill-Lynch, 1999). These are massive sums, and they do not include the considerable opportunity costs of lost output for society resulting from student participation in education and training rather than the workplace.

At the same time, there have been persistent concerns about the efficiency of educational spending. Hanushek (1986, 1997) has used results from educational production functions to argue that elementary and secondary schools allocate their resources in a highly inefficient way. Although his interpretations have been challenged by Krueger (2000), no one has argued that educational spending is highly efficient. Indeed, at least one of the reasons for the movement toward charter schools and vouchers is the

view that changes in the organization of education and the use of market incentives will improve the effectiveness of resource use in education. And there is considerable criticism of the effectiveness of elementary and secondary schools, particular for minorities, immigrants, and the poor. In higher education, there are serious challenges with regard to both costs and productivity. Tuition costs and state subsidies per student have risen at a faster rate than inflation, and there are no obvious improvements in productivity (Groccia and Miller 1998).

At the same time, evaluators and public policy analysts have an important tool to guide resource allocation: cost-effectiveness analysis. Cost-effectiveness analysis provides a method of comparing alternatives for their relative costs and results and providing guidelines on which of the alternatives provides the most impact relative to cost. It differs from its close relation, cost-benefit analysis, which requires monetary measures of impact relative to costs. Most endeavors to improve education are unable to use cost-benefit analysis because it is difficult to measure the values of the improvements in market terms or benefits. But it is possible to measure academic achievement and other measures of school quality and effectiveness. Accordingly, cost-effectiveness analysis enables measures of learning, as well as other appropriate indicators to be used to assess educational outcomes relative to costs.

Cost-effectiveness analysis emerged in the 1960s as an important method for choosing among costly weapons systems. Gradually the tools of cost-effectiveness analysis made their way from the Pentagon to other government agencies with President Lyndon Johnson's requirement that all budgetary requests be supported by a program-planning-budgeting system that tied mission and goals to costs. Over subsequent decades, advances were made in refining the techniques and improving their user-friendliness (Levin, 1975). A particularly strong expansion of cost-effectiveness analysis is found in the evaluation of health services (Drummond, O'Brien, Stoddart, and Torrance, 1997; Gold, Siegel, Russell, and Weinstein, 1996). In the health domain, some efforts have been particularly ambitious. For example, the State of Oregon attempted to use the tool to ascertain the priority and reimbursement rates of state-supported medical procedures (Eddy, 1991). The World Bank undertook a massive and comprehensive study to guide resource allocation for twenty-four categories of health interventions for disease control in developing countries by using a cost-effectiveness framework (Jamison, Mosley, Measham, and Bobadilla, 1993).

And apparently cost-effectiveness evaluators have been busy in education. A November 2000 search of the Education Resources Information Center (ERIC), a database funded by the federal government, located about 11,800 articles, reports, and other documents addressing cost-effectiveness in education. This was about 2,400 items greater than a similar search revealed in 1996, suggesting an increase of 600 each year. Thus, it would appear that cost-effectiveness studies in education are both much in demand

and much in supply through the efforts of evaluators. But on closer inspection, there is much less than meets the eye. Surprisingly, there seems to be neither an abundant database of literature on cost-effectiveness in education nor much of a demand for such studies.

This chapter shows that what seems to be a surprise should not be surprising to policymakers. It focuses on the dearth of cost-effectiveness studies in education, despite the large numbers of studies that use cost-effectiveness jargon, and the reasons that the tool has not flourished as it has in the area of health care, as well as some ways of promoting its use.

### **What Is Cost-Effectiveness Analysis in Evaluation?**

Cost-effectiveness analysis refers to a method for combining appropriate measures of outcomes with costs so that program and policy alternatives can be ranked according to their effectiveness relative to resource use. Presumably the alternatives with the least cost relative to their results (or best results relative to costs) are the ones that are most attractive for adoption. This information should be viewed as helpful in guiding, but not determining, decisions. Other issues such as implementation feasibility need to be considered in the decision process (Levin and McEwan, 2000).

Most of the public policy audience and professional evaluators would agree that cost-effectiveness should be taken into account in decision making. But while this audience is usually very circumspect when it comes to estimating the effectiveness of alternatives, it is completely lax when referring to costs. The path that is often followed is based on the assumption that budgets or expenditure statements contain the requisite information and that it is necessary only to read the appropriate figures from such statements or get an accountant or manager to provide the right numbers. Unfortunately, estimation of costs requires a set of methodological procedures that must be followed to obtain accurate and consistent cost estimates, just as studies of effectiveness require such procedures. In general, there are three steps to designing and implementing a cost analysis. (For details, see Levin and McEwan, 2000.)

First, the resources or ingredients are identified that are required for each alternative. These details are fundamental, before any monetary values are attempted. Basically they respond to the question of what resources were required that accounted for the levels of effectiveness of each of the alternatives. The precise types of personnel are specified according to their qualifications and time commitments. A similar exercise is carried out for facilities, equipment, and other program inputs, as well as for client resources. Details on ingredients are obtained from descriptive reports, observations, and interviews.

Once the ingredients are set out, it is possible to place values on them. To as great an extent as possible, market prices for each ingredient are derived for each and used to value them. In many cases, the ingredient will

not be obtained through a market transaction such as space in a building that is owned by the sponsoring entity or in-kind resources such as volunteer time. In those cases, so-called shadow prices—the estimated value of the resource based on an alternative procedure—are used. Although some of these costs can be obtained from expenditure information, much of that information will be incomplete or inappropriate, so one must be exceedingly cautious in ascertaining precisely how expenditures are accounted for by these sources.

Once the costs of individual ingredients are obtained, they can be summed to estimate the total cost of each alternative. In education, these are normally viewed on a per-student or per-participant basis (average cost) to compare effectiveness per unit of cost among alternatives. At the same time, it is important to analyze the distribution of the burden of costs among different sponsoring entities as well as clients to find out who pays the costs for each alternative. Cost information is combined with effectiveness to make cost-effectiveness comparisons. Similarly, the same type of cost analysis can be used to compare alternatives on a cost-benefit or cost-utility basis if appropriate data on benefits or utilities are available. The main point here is that cost analysis must be treated methodically just as effectiveness analysis is. It is not a casual activity or a rhetorical one.

### **Cost-Effectiveness Studies in Education**

About thirty years ago, I started my own sojourn in this field. I wanted to establish cost-effectiveness analysis as a useful evaluative and policy tool in the field of education and the other areas of human service. As an early demonstration, I used data from the Coleman Report (1966) to compare the cost-effectiveness of two alternative strategies for teacher selection: hiring more experienced teachers or those with higher verbal test scores. The results suggested that it was from five to ten times as effective per unit of cost to raise student achievement by getting more verbally able teachers than those with greater experience. I followed this with a cost-benefit study for getting all students to high school completion. This study suggested that the benefits of such an accomplishment were seven times as high as the costs and that the returns in higher government revenues exceeded government costs by a ratio of two to one.

Three decades ago, it was obvious that the use of cost-effectiveness analysis to judge educational interventions was not of much interest to economists. The field of economics of education was derived from human capital theory and was devoted primarily to the estimation of rates of return to educational investments rather than efficiency in institutional resource allocation by level of education. Of course, rate-of-return analysis is a form of cost-benefit analysis, but not one that is very useful for reviewing the effectiveness of educational interventions designed to improve student achievement. Even today, rate-of-return analysis is far more prominent than

cost-effectiveness research in the field of education. Educational evaluators were preoccupied with educational effectiveness, regardless of cost implications. It seemed that a major priority should be the integration of costs with effectiveness measures to rank alternatives according to their efficiency in resource use. Because economists showed little interest, I saw the appropriate response as convincing educational evaluators to add cost analyses to their evaluation tool kits. My hope was that cost-effectiveness studies would make their way into the emerging field of social evaluation.

What was needed was a systematic method of measuring costs that could be integrated with effectiveness research to establish cost-effectiveness comparisons. Early in the 1970s, I worked to develop a method to undertake cost-effectiveness analyses by evaluators. This method took the form of estimating costs on a financial spreadsheet, incorporating the three steps set out above. The work was published for an evaluator audience in the first *Handbook of Evaluation Research* (Levin, 1975). Evaluators expressed great interest in learning more, so I devoted myself to a book-length treatment of the subject (Levin, 1983). This book had strong sales (ultimately thirteen printings), suggesting wide interest in the field.

Despite the substantial sales of the book, the actual presence of cost-effectiveness evaluations in education was minimal. A survey that I did for the years 1985 through 1988 found that less than 1 percent of the presentations at the annual meetings of the American Evaluation Association used cost-effectiveness analysis or included it as a component of evaluations, and the topic was virtually invisible at the annual meetings of the American Educational Research Association during those years (Levin, 1991). Monk and King (1993) chose two scholarly journals to compare for their coverage of cost-effectiveness analysis over a five-year period in the late 1980s and early 1990s. *Educational Evaluation and Policy Analysis* (EEPA), a journal of the American Educational Research Association, is the main general outlet for studies of educational evaluation. The *Journal of Policy Analysis and Management* (JPAM), sponsored by the Association for Public Policy Analysis and Management, is a broader journal covering many policy fields. Both journals are highly refereed, so one would expect what was published to be of high quality. Although 80 percent of the JPAM articles dealt with explicit issues of cost, only 25 percent of the EEPA articles were in that category. This does not mean that the articles provided fully developed cost-effectiveness studies, only that they addressed costs.

In 1996 the preparation of the second edition of the cost-effectiveness book provided me and my coauthor, Patrick McEwan, with the opportunity to revisit the literature to see what had been accomplished since publication of the first edition in 1983. McEwan surveyed a wide base of literature for potential case studies and examples of cost-effectiveness analysis in education. In checking all of the standard literature sources in economics, education, and public policy, he found very few cost-effectiveness studies in education generally and no great upsurge for recent years. In contrast, the

health literature was replete with a very large number of cost-effectiveness studies and a wide acceptance of the tool in the evaluation literature in that field (summaries are found in Drummond, O'Brien, Stoddart, and Torrance, 1997; Gold, Siegel, Russell, and Weinstein, 1996; Sloan, 1995).

At the same time, William Clune of the University of Wisconsin undertook a study of the methodological strengths and policy usefulness of published research on cost-effectiveness in education (Clune, 1999). (I was an adviser on the study.) Using the ERIC database for studies incorporating the term *cost-effectiveness*, Clune found over 9,000 titles. The sheer volume of studies using that key word was in sharp contrast to the few studies that we had uncovered. Limiting the search to 1991 through 1996, he found 1,329 titles. Abstracts of the studies were obtained and allocated among four categories according to apparent methodological rigor:

Rhetorical—cost-effectiveness claims with no data on either costs or effects  
 Minimal—minimal data, such as potential categories of effectiveness or cost feasibility with no evidence of systematic study  
 Substantial attempt—attempt to mount data on cost and effectiveness but with serious flaws, such as effectiveness design or cost measurement  
 Plausible—ingredients or resource approach to costs and a strong effectiveness design with comparisons among alternatives

In order to make the survey manageable, Clune removed studies that did not focus on outcomes of elementary and secondary education. This reduced the sample to 541 studies. Based on the abstracts, he found that more than 80 percent of the studies were rhetorical (56 percent) or minimal (27 percent). Only 1 percent were plausible, and another 1 percent were between substantial and plausible, with the remaining 15 percent being substantial. Clune asked me to provide an independent rating of studies in his sample. We found that his ratings were more generous than mine.

Clune then proceeded to an evaluation of a 10 percent sample of the full studies to confirm whether ratings from the abstracts were consistent with ratings of the full studies. The initial distribution of ratings of the abstracts was similar to the pattern of ratings of the full studies, with only minor changes. He found that none of the full studies reached the top category, and slightly fewer would be placed in the bottom two categories (70 percent rather than 80 percent). The average rating based on readings of the full studies was 1.93, indicating something better than rhetorical but not quite minimal. Most important was the fact that there was very little cost-effectiveness analysis in the body of literature that claimed to have findings on cost-effectiveness in education. Overall, this does not suggest great confidence in studies that claim to have produced cost-effectiveness results.

Perhaps most discouraging is the fact that even when recognized scholars claim to do cost-effectiveness studies, they often shortchange the cost analysis. That is, the same persons who have great concern for the validity

and implementation of evaluation designs of effectiveness and reliability of measures ignore completely the methodology of cost analysis in making cost-effectiveness claims. Two recent examples of interesting studies by well-known scholars are informative. Mayer and Peterson (1999), in their book on school reform, provide a summary chapter on costs and benefits of school reforms. But they measure both costs and benefits in a cursory manner, and they derive the putative benefits of the effectiveness from systematic studies.

Their estimate of the cost of class size reduction, for example, is not based on any cost study at all. Instead, the authors determine costs by such steps as “assuming annual compensation of \$44,000” for teacher compensation and assuming that classrooms “might represent roughly a third the cost of additional personnel” (p. 351). No justification or data set is provided that supports these assumptions. Moreover, the reputations of these authors in evaluation work suggest that neither would be likely to choose the effectiveness of an intervention by virtue of assumption. Indeed, they have ignored the systematic methods that have been developed for estimating costs, and the cost-effectiveness studies exist that have compared reductions in class size with other interventions (Levin, Glass, and Meister, 1987). Costs of school choice programs are given as “none,” although the cost analysis of a prototype voucher system has suggested considerable costs beyond the existing system for record keeping, transportation, information, and adjudication (Levin and Driver 1997).

This relative dearth of cost-analysis studies in education and the poor quality of what does exist represent a puzzle, especially in comparison with the quantity and strength of the cost-effectiveness literature in health.

### Explaining the Paradox

It is not easy to explain this phenomenon. What may appear to be causes may also be consequences. For example, we may find that there is a lack of training among educational evaluators in the methods of cost-effectiveness analysis. But if there is not much demand for such studies among policy-makers, it would not be surprising to find few studies and little training in an area that is of low priority. Nevertheless, there are possible explanations.

**Lack of Training.** Because evaluations in education are done primarily by persons who consider themselves to be evaluation specialists, it is useful to review both training programs and textbooks. To my knowledge, there is no system for ranking systematically the various programs of preparation for educational evaluation. Accordingly, I compiled a list of these programs by soliciting the opinions of three noted educational evaluators. This list is not complete, but it is probably representative of the better-known programs preparing evaluation specialists in education. The list includes programs (in alphabetical order) at Arizona State, the University of California at Berkeley, the University of Colorado, Columbia, Harvard, the University of Michigan,

Northwestern, Stanford, the University of California at Los Angeles, Vanderbilt, and the University of Wisconsin. I checked both the course catalogues and the Web sites for information on each of these programs to ascertain whether some training was required in cost-effectiveness analysis. Although each program listed some course requirements, I could not find a single program that required a course or training in cost-effectiveness. In fact, in my thirty-one years as a member of the faculty at Stanford University, I was unable to convince my colleagues that evaluation experts need training in cost-effectiveness analysis. In summary, cost-effectiveness analysis is viewed as unnecessary for training educational evaluation specialists.

I also reviewed the top master's programs in public health as listed by *U.S. News and World Report*. These included, in descending order of ratings, Johns Hopkins, Harvard, the University of North Carolina, the University of Michigan, the University of Washington, Columbia, the University of California at Berkeley, the University of California at Los Angeles, the University of Minnesota, and Yale. Virtually all of these schools have a program in health policy that requires a course in finance and one in health policy administration. Calls to three of these schools revealed that cost-effectiveness analysis is covered in the health policy concentration. Based on this information and publications in the health evaluation literature, it is clear that training programs in the areas of public health seem to incorporate literature, studies, and methods of cost-effectiveness analysis, whereas the technique is virtually absent from evaluation training in education.

Additional confirmation of this finding is reflected in a search of textbooks used in courses on educational evaluation. A sampling of courses and instructors in the institutions already noted yielded the following books: Berk and Rossi (1990), Fink (1995), Patton (1997), Popham (1988), Rossi, Freeman, and Lipsey (1999), and Sax (1989). This list is incomplete but representative of the field. Patton (1997) is virtually devoid of cost-effectiveness methodology. Popham (1989) includes a 19-page chapter that provides little information beyond an introduction. Sax (1989), in its 678 pages, does not mention cost-effectiveness analysis, nor does Fink (1995). Rossi, Freeman, and Lipsey (1999) provide a full chapter on "measuring efficiency." The chapter is an excellent introduction but does not provide training or skills in doing cost-effectiveness analysis. Berk and Rossi (1990) barely mention the subject. In most of these textbooks, the subject of cost-effectiveness analysis is nonexistent or worthy only of superficial mention.

The evidence is consistent that training programs in educational evaluation do not require preparation in cost-effectiveness analysis and that the tool is probably not familiar to those teaching or working in the field of educational evaluation. This conclusion is also confirmed by the cursory treatment or complete absence of cost-effectiveness analysis in evaluation textbooks used for courses in educational evaluation.

**Lack of Effects.** A second plausible reason for the absence of cost-effectiveness analysis in educational evaluation is that most educational

research does not provide an unambiguous estimate of effects. Many, if not most, rigorous studies seem to find statistically insignificant results or differences in effect sizes that are so small that they lack practical significance. Even when results are found, such as in studies of class size reduction (Grissmer, 1999) or differences in student achievement between public and private schools, the effectiveness of these interventions is usually subject to controversy. Clearly, if there are few evaluation results on effectiveness that are accepted in education, any cost analysis will be viewed as gratuitous. My reading of the evaluation research literature is that there is less than meets the eye. That is, there is a huge stock of educational research, but much of it is of poor quality or idiosyncratic so that it cannot be generalized. Nevertheless, there are still substantial numbers of good studies that show at least some replications. Thus, it is not clear how important this reason is for the lack of cost-effectiveness evaluations in education.

**Lack of Demand by Policymakers.** A third reason that might explain the lack of development of cost-effectiveness studies in educational evaluation is that policymakers do not demand them. Consider that a systematic study of program evaluation units in all fifty state departments of education in the early 1980s found that not only did such units lack the capacities to do such analyses, but they were not called on to do them (Smith and Smith, 1985). Interestingly, few inquiries or policy decisions in education use information on cost-effectiveness analysis as a criterion. Even government units with responsibilities for budgetary analysis rarely use the tool. For example, the California legislature's Legislative Analyst's Office evaluates prospective legislation and constitutional initiatives for financial and other consequences. But the financial implications are reviewed separately from the potential effectiveness and not compared with other alternatives for using such resources.

In fact, there is very little funding for educational research and evaluation. The field of education has nothing comparable to the National Institutes of Health with its annual budget of about \$16 billion in 2000. In contrast, the federal budget for educational research and dissemination was about \$350 million, of which a large share was addressed to dissemination. Furthermore, much of what is called educational research is actually the collection of data for statistical reports such as those of the National Center for Educational Statistics. Pharmaceutical companies and medical suppliers, two very large industries, invest their own money in health care research because of the large potential payoffs to cost-effective products and services. There is no counterpart in education. Even the recent trend toward privatization of education in the United States and for-profit educational management organizations seems to generate far greater investments by the industry in marketing than in evaluation, and there is little evidence of important contributions to the research literature from this source. Without considerable resources for research and evaluation in education, it is not only the field of cost-effectiveness in education that is constrained but also educational evaluation itself.

At bottom is the possibility that not only do decision makers ignore cost-effectiveness analysis in their decisions to allocate resources; they may also actually find that it is a distraction that they wish to avoid. After all, cost-effectiveness analysis results may appear to hinder their discretion. By providing comparative indicators of both results and costs, the information will tend to inhibit expenditures on alternatives that are costly relative to their effectiveness. For example, one study found that peer tutoring was far more cost-effective in increasing student achievement in reading and mathematics in elementary and secondary schools than computer-assisted instruction, longer school days, and longer school years (Levin, Glass, and Meister, 1987). In fact, longer school years seemed to be the least cost-effective of the alternatives, but California and other states have spent billions of dollars to increase the length of the school year by a few days a year. Computers were considered to be the new elixir for education, and smaller class sizes were popular among teachers, parents, and politicians. Ostensibly, there were no additional resources invested in peer tutoring, but the states and federal government enthusiastically reduced class size, increased the length of the school day, and promoted computers.

In this respect, cost-effectiveness results may even serve as a threat to decision makers by providing information that is counter to common sense, popular appeal, and support of particular constituencies. It also may promote solutions that can be adopted only at the local level, such as peer tutoring, in contrast to changing mechanically the formulas for class size and school sessions, which can be determined by legislative and congressional fiat.

## **Conclusion**

Of the three hypotheses that might account for the lack of significant development of cost-effectiveness evaluation in education, two address the supply side of evaluation. The first is the lack of apparent capacity and training in the field. There is obviously some truth to this explanation. Few evaluators have the training to do a competent cost-effectiveness evaluation, training programs in and textbooks on evaluation are weak on cost-effectiveness, and economists have not selected cost-effectiveness as an important area in which they address school effectiveness. The other supply explanation is the lack of effectiveness results that can be relied on. Without good estimates of the effectiveness of alternatives, cost estimates would seem superfluous. There is some truth to each of these, but I argue that the main culprit is a lack of demand.

If there is not much demand for cost-effectiveness analysis or if it is even viewed as onerous by decision makers, this will influence considerably the opportunities and the priorities in training. More and better training is a necessary condition but not a sufficient one to develop the activity. The same is true for the explanation that educational research is often

unable to identify effective alternatives. Clearly, better training of researchers and more investment in effectiveness research could address these issues. But effectiveness results for computer-assisted instruction, peer tutoring, longer school days, and class size reduction have shown a pattern of effectiveness that is fairly consistent (Levin, Glass, and Meister, 1987). Yet a cost-effectiveness study of these alternatives is in conflict with the policy directions that subsequently were chosen.

More spending on educational research is also a derivative finding. Why spend more on information that is unlikely to be used for policy? Indeed, this seems to be the key issue. If cost-effectiveness analysis has a contribution to make in a sector that is spending at least \$2 billion a day and billions of dollars in student time, how can we get the tool to be used in policy and decision making? We must convince both agencies that support research and evaluation and decision makers who might be persuaded to use it to push for cost-effective analyses when they fund research and evaluation. In order to convince them, we must continue to demonstrate the value of cost-effectiveness analysis and show the potential cost savings of using more cost-effective approaches over ones that are less cost-effective. At the same time, we must educate policymakers and evaluation funders about what cost-effectiveness attempts to do. These entities need to have an intuitive—if not a formal—understanding of what an acceptable study requires. In addition, they need to reject the rhetorical assertions that particular alternatives or educational interventions are “cost-effective” when there is no study or only a very primitive one.

One possibility is that the further that policymakers are removed from educational decision making, the more they will rely on cost-effectiveness or cost-benefit studies. When they are close to the locus of decision making—for example, at the local level—they are heavily influenced by their own perceptions of effectiveness and cost-effectiveness of interventions. In addition, they are likely to be besieged by considerable pressures from local educational and political constituencies, often in the form of personal appeals by colleagues or parents. Thus, reliance on formal evaluations and analysis would seem to be superfluous. But when the decision making is remote from the experience of decision makers and is less directly influenced by constituents who will be affected directly by decisions, formal analysis is more attractive. Indeed, such analyses can be used to defuse the competing claims of lobbying groups.

Since more than 90 percent of educational spending is derived from state and local sources, this could provide a partial explanation of why there is so little demand for cost-effectiveness studies in elementary and secondary education. Where the federal government allocates all or most of the resources for a program, we would expect to see more sponsorship of cost-effectiveness or cost-benefit studies and their use. Appropriations for the Job Corps were threatened by the federal budget process on at least four occasions, but the consistent findings from cost-benefit studies, financed by

the federal government, that the benefits of Job Corps training exceeded considerably the costs drove the survival and expansion of the program (Cain, 1968; Thornton, Long, and Mallar, 1982). Discussions with early childhood experts have suggested that the survival and expansion of Head Start is largely due to a range of studies on costs and effectiveness, especially the Perry Preschool Evaluation (Barnett 1993, 1996), which showed that benefits far exceeded costs.

But the fact that only about 6 percent of elementary and secondary revenues are derived from the federal government suggests the limits of creating a demand for and supply of cost-effectiveness studies from federal educational programs. Perhaps different strategies need to be used to generate such studies and their uses at state and local levels. Of key importance are the roles of the states; they not only fund a considerable share of education, but they also have a great deal of authority and discretion in guiding local spending. For example, almost all states have established standards and testing for their schools with various interventions, such as incentives for good results and greater state monitoring when the results are poor.

Given the existing lack of interest by those who fund research and evaluation and those who use its findings, these educational activities will not be easy to accomplish. One possibility is to work with major policy brokers like the Education Commission of the States to provide seminars on cost-effectiveness analysis with excellent case studies for legislative and governors' staffs dedicated to education. This approach also needs to be pursued in state departments of education and the U.S. Department of Education. Whether it will change matters is unclear. But without a major increase in the demand for and use of cost-effectiveness results in education, it is unlikely that the field will develop more fully over the coming decades.

## Notes

1. For a lengthier treatment of these distinctions, as well as a contrasting description of cost-utility analysis, see Levin and McEwan (2000, Chap. 1).
2. For information on cost-benefit and cost-utility analysis, see Levin and McEwan (2000, Chaps. 7, 8).
3. Clune's work provides powerful evidence of the sparse use of cost-effectiveness studies in education.
4. Paradoxically, the Perry Preschool intervention preceded the launch of Head Start. Yet its findings have been influential for considering the effectiveness of Head Start.

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