



The critical importance of costs for education decisions

This brief is intended to help decision makers in schools, districts, state education departments, and intermediary organizations think about ways that cost analyses can help inform their decisions about program choices, budgets, and strategies.

Why cost information matters in education

Decision makers must often choose among a variety of programs or strategies when considering how to improve student results

A growing body of high-quality research can help inform whether and how specific reforms and programs improve students' academic outcomes. But without accurate measures of the costs of producing those outcomes, the picture is incomplete. Even the best programs and policies fail when budgets are inadequate or when implementation is not rigorous. Within given budget constraints, educators must consider how to optimize existing or future resources to ensure the best possible learning outcomes for students.

Decision makers must often choose among a variety of programs or strategies when considering how to improve student results.

For example, a school leader seeking to help struggling elementary school readers improve their reading fluency may need to choose between two early literacy programs: Literacy Groups, a pull-out program that serves students in groups of four, and Literacy Afterschool, an afterschool program that serves students in pairs.¹ Both programs require teachers to work with small groups of students, but the programs may differ in:

- Length.
- Frequency of intervention.
- Duration of each session.
- Number of students served over the year.
- Materials, equipment, and facilities needed.
- Amount of teacher training required.

Each of these differences will affect the costs of implementation.

¹ These program names are fictitious.

Weighing options

Sometimes, the available options vary substantially. For example, educators have used computer-assisted instruction, peer tutoring, longer school days, and class size reduction to improve elementary reading and math. Each strategy makes different demands on personnel, facilities, and scheduling; therefore, each one could result in different costs to gain the same level of student improvement.

Cost analysis can help in planning and adopting a new program or in improving an existing program.

If these different demands and costs are not fully anticipated, the chosen education strategy may not be implemented properly because of inadequate resources. These problems, in turn, will reduce the chances of achieving the desired results for students. Awareness of resources needed for proper implementation can help ensure program success. It also makes it more likely that, when two options are expected to produce the same student gains, education decision makers will have the information needed to choose the program that is least costly to implement.

Cost metrics to inform decision making

To measure costs, all of the resources or “ingredients” required for successful implementation of a program or strategy must be identified and a dollar value determined for each one. The costs identified should be based on real-life implementation of the program rather than on generic or idealized program descriptions. Useful metrics include:

- Total program costs for all participants served.
- Average program costs per student or teacher served.
- The range of costs per participant—that is, the low and high costs if some participants require more resources from the program than others.
- The marginal costs of adding each additional participant to an established program.

Separating costs into categories, such as personnel, facilities, materials, and equipment, reveals the different ongoing resource needs of a program, which may affect its sustainability.

For planning purposes—particularly when considering the optimal scale of a program—it is important to understand which costs are fixed and which costs vary with the number of participants. For example, a program supervisor’s time for Literacy Afterschool, one of the two early literacy programs introduced on page 1, may be a fixed cost if there is only one supervisor, regardless of the number of students served, but costs of materials and teacher time are likely to vary depending on how many students participate in the program.

Additionally, site-level cost information can highlight operational differences at each program location so that administrators can identify opportunities to improve program efficiency. Continuing with the Literacy Afterschool program example, at one school the students may be taught by a teacher, while in another school the students are taught by parent volunteers. At the second school, costs per participant may be lower, but the absence of a professional teacher may also affect the extent to which the program helps the students improve their reading fluency.

Finally, it is also useful to determine what portion of the total program costs each stakeholder group is responsible for—that is, who pays the costs. A school may be responsible for some of the costs of implementing a new program, while other costs may be borne by the district, a local community partner, or even volunteers. For example, having parent volunteers consistently available to help with an afterschool program would reduce the school’s costs for staff time. Or if a local company commits to providing new

laptops to students every three years, a school can substantially reduce its technology acquisition costs for a one-to-one laptop initiative, although it would still be important to anticipate ongoing costs of laptop maintenance and instructional technology support.

How cost analyses can inform decision making

Cost analyses can be helpful for a variety of decision making purposes, either in planning and adopting a new program or in improving the operation of an existing program. Decision makers can use cost analyses to inform decisions in the following ways:

- **To determine the resources needed and the associated costs to implement a new program.** The most basic use of cost analysis in education is to assess the resources required to implement a new program and to determine what these resources will cost. Before adopting a new program and with this information in hand, decision makers should ask this critical question: does the school or district have sufficient resources available to guarantee that the program will be implemented as envisioned? If not, can the missing resources be procured?
- **To make smart decisions about existing programs.** Cost analysis can inform decisions about existing programs. It can facilitate the monitoring of and accountability for ongoing programs by determining whether resources are being used as planned and are being distributed equitably. It can also show whether a program is sustainable and reveal how deviations in implementation may affect both costs and effectiveness.
- **To identify which sites are doing the best job in implementing a program.** Costs can be compared across program sites to spotlight efficiencies and best practices in resource use and to identify sites that are lacking adequate resources. Decision makers can subsequently make informed adjustments to program activities and resource allocation among sites.
- **To decide whether to scale up or cut back on a program.** By documenting the financial, personnel, and other resources needed to serve program participants and assessing the feasibility of allocating more resources to the program, decision makers can determine the number of additional students that can be served by an existing program and estimate the optimal enrollment. If budget cuts are necessary, information on costs per participant and cost per service component can be used to determine whether to target only the neediest participants or to adjust the amount of each service to ensure that at least a minimal level of services is provided for all potential participants.

Example of using cost analysis for a decision about whether to scale up implementation of a program

A large school district in the eastern United States is assessing the effectiveness of a digital program for improving elementary school literacy. District office evaluators are conducting an experiment in which some students are assigned to the program and a set of comparable students are not. Reading performance of students in the two groups is being compared. The district will use the results of the effectiveness study to decide whether to scale up the program across the entire district. Estimating the costs of program implementation before attempting to scale up will allow the district to determine whether the necessary personnel, equipment, and other resources will be available districtwide to support implementation at scale. The district can then balance the expected gains in literacy against the burden on resources. If the program results in significant improvements in literacy, the district may be willing to expend substantial resources on districtwide implementation. However, if the program only marginally improves literacy but places a heavy demand on resources, the district may decide against scaling up. On the other hand, if the program does not result in any change in literacy performance but places fewer demands on resources, it may still be worth considering for widescale adoption.

Resources to help calculate costs of education programs

Analyzing the costs of implementing education programs can be a demanding undertaking. A free, online tool, [CostOut](#), funded by the Institute of Education Sciences at the U.S. Department of Education, can help district personnel estimate and compare the costs of implementing different education programs. Once district personnel have entered a list of all personnel, facilities, materials, equipment, and other resources required to implement the program and have indicated how many participants will be served, CostOut can help:



- Estimate total program costs and costs per participant.
- Assess how costs change as the number of program participants varies.
- Assess how costs change as different resources are substituted for existing ones.
- Spread the burden of costs across a number of stakeholders, such as the school, district, and parents, to make it clear who will pay for which aspect of implementation.

CostOut includes a database of national average prices of education resources, such as teacher and principal salaries and benefits rates and education facilities, materials, and equipment. Users can add their own local prices as well. CostOut can be used to help conduct various types of cost analyses, as discussed in the next section.

Types and uses of cost analysis

When only the costs of a program are being considered for a decision, the type of analysis may be called a **cost-feasibility analysis**. Decision makers can use this type of analysis to assess whether, given available budget and resources, it is feasible to implement a new program or whether an existing program can be scaled up to serve more participants. For an early literacy program like Literacy Groups, described on page 1, cost considerations would include whether new teachers must be hired or whether existing teachers can be trained to deliver the program, how many hours of teacher and other personnel time are needed to implement the program, what additional materials or equipment must be purchased, and what physical space is needed to serve students. Depending on the availability of resources, the district could determine how many students can be served by the program and establish a cut-off for eligibility—for example, all first graders scoring below the 25th percentile on a literacy assessment.

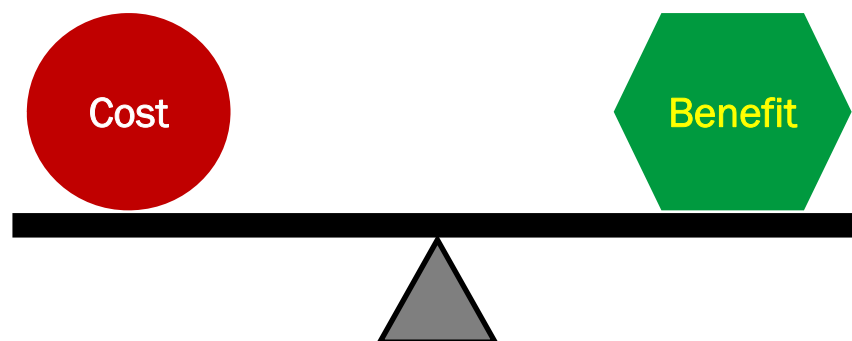
Decision makers can compare information on program costs to program results to conduct a cost-effectiveness analysis to inform a choice among several programs, a cost-benefit analysis to assess whether a program is providing a good return on investment, or a cost-utility analysis that assesses the value of alternative programs based on a number of objective and subjective dimensions, which may include evidence of effectiveness at improving student outcomes as well as some measure of parent support. A combination of cost data with information about the results of a program underlies several types of cost analysis:

- **Cost-effectiveness analysis.** When more than one program is available to help improve a specific student outcome, it is useful to compare the costs of each program with its impact on that outcome. For example, if the goal is to improve first grade reading fluency, decision makers can compare the costs of implementing Literacy Groups and Literacy Afterschool with the expected increase in performance on a fluency assessment associated with each program. Literacy Groups, the pull-out program that serves students in groups of four, may cost \$6,000 per student and result in a 5-point greater gain in fluency scores compared with similar students not being served by the program. Literacy Afterschool, the

afterschool program that serves students in pairs, may cost \$8,000 per student and confer a 10-point greater gain in fluency scores. While Literacy Afterschool is more costly overall, the cost per extra point gained in fluency scores is \$800 (\$8,000/10 points), while for Literacy Groups it is higher, at \$1,200 (\$6,000/5 points). If the district can afford and implement either program with fidelity, decision makers can use this analysis to decide whether the additional 5-point gain produced by Literacy Afterschool is worth the extra \$2,000 per student.

- **Cost-benefit analysis.** The term “cost-benefit analysis” is often used informally to describe professional judgments about whether investing time and money in a program or strategy is worthwhile. However, formal economic analysis can be used to assign monetary values to program results so that the dollar value of the results can be compared directly to the dollar amount of costs. For example, if Literacy Afterschool, described above, helps a student avoid special education services costing \$10,000 per year in second grade and beyond, the \$8,000 investment in first grade is more than justifiable on financial grounds.
- **Cost-utility analysis.** Education leaders must often consider multiple factors and stakeholder groups when choosing among programs: in addition to assessing costs and gains in student performance, they may consider, for example, teacher buy-in, parent preferences, and compatibility with the existing curriculum. In a cost-utility analysis each of these dimensions of program value is measured and contributes to an overall assessment of each program. For example, if Literacy Groups, described above, is strongly preferred by parents and teachers because it is delivered during school time rather than after school, this preference could tip the balance against Literacy Afterschool, especially if a 5-point gain in fluency scores is considered sufficient by all parties. Cost-utility analysis provides a framework to balance the costs of a program with its overall perceived value to program stakeholders.

Different methods of cost analysis can answer cost-related questions from different angles. Each method has distinct advantages and disadvantages. The table on page 7 summarizes the advantages, disadvantages, and possible applications of each type of cost analysis.



Summary

As pressure builds for evidence-based decision making in schools, cost analyses conducted in conjunction with assessments of program results provide valuable information to guide choices among education programs and strategies. Such analyses provide justification for resource use and information for optimal resource allocation and equitable distribution of resources. Decision makers can use cost analysis to:

- Assess the resources required and costs of implementing a new program.
- Inform monitoring, accountability, and resource use of ongoing programs.
- Determine whether resources are being distributed equitably across sites and participants.
- Inform decisions regarding scale of program implementation and level of services provided.
- Compare several programs to help select the most effective one for students, relative to its cost.
- Balance the costs of an education program against the expected results to determine whether it represents a wise investment of resources.
- Compare several programs to weigh costs against how well each program meets stakeholder needs.

In sum, education decision makers can make more informed decisions by considering the results of interventions, strategies, and practices in light of implementation costs. Resources such as CostOut are increasingly becoming available to facilitate cost analysis.

Summary of the purposes and possible applications of four types of cost analysis

Type of cost analysis	Purpose	Advantages	Disadvantages	Possible applications
Cost-feasibility	To assess whether adequate resources are available to implement a new program ^a as intended or scale up an existing one	<ul style="list-style-type: none"> • Can be used to swiftly rule out program choices that cannot feasibly be implemented in the decision maker’s context 	<ul style="list-style-type: none"> • Considers only costs, not effectiveness, benefits, or utility 	To determine whether a district can afford laptops for every student and teacher and the necessary teacher training
Cost-effectiveness	To assess which of several programs produces the desired education outcomes for the lowest cost or maximizes education outcomes for a given amount of investment	<ul style="list-style-type: none"> • Can be used to decide among alternative program choices • Includes consideration of program effectiveness as well as costs or use of resources 	<ul style="list-style-type: none"> • Can evaluate several programs but only one education outcome (such as reading comprehension) at a time 	To decide which of two reading programs will be most effective, relative to its costs, for improving reading comprehension
Cost-benefit	To determine whether the economic benefits of a program exceed the costs	<ul style="list-style-type: none"> • Can compare the resource requirements and benefits of two or more programs with similar or different objectives 	<ul style="list-style-type: none"> • Requires estimating benefits as dollar values 	To assess whether the expected benefits of a costly dropout prevention program merit the investment of resources
Cost-utility	To compare the costs of a program with its usefulness to program stakeholders	<ul style="list-style-type: none"> • Allows consideration of multiple factors beyond effectiveness and costs • Allows multiple stakeholders to participate in the decision about which program to implement • Can be used when little objective evidence of effectiveness exists as yet • Can be used when programs address more than one educational outcome—for example, both reading and math 	<ul style="list-style-type: none"> • Produces results that are relevant only to the context in which the analysis is conducted 	To include a variety of stakeholders (such as teachers, parents, and special education coordinators) and various types of evidence (such as effectiveness, costs, parent preferences, and demand on teacher time) in deciding how best to deliver special education services

a. In this table “strategy,” “intervention,” or “policy” can be substituted for “program.”

Source: Adapted from table 1.5 in Levin, H. M., & McEwan, P. J. (2001). *Cost-effectiveness analysis: methods and applications* (2nd ed.). Thousand Oaks, CA: Sage Publications.

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