CAP Project

COST ANALYSIS STANDARDS & GUIDELINES 1.0

June 2020

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The development of these guidelines was supported by the Institute of Education Sciences, U.S. Department of Education, through R305U200002 to Teachers College, Columbia University. The opinions expressed are those of the authors and do not represent views of the Institute or the U.S. Department of Education.

Suggested citation: Hollands, F.M., Pratt-Williams, J., & Shand, R. (2020). *Cost analysis standards & guidelines 1.0.* Cost Analysis in Practice (CAP) Project. https://capproject.org/resources

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INTRODUCTION

These guidelines provide recommendations for a standardized approach to cost analysis of educational programs[1] to facilitate generalizable and comparable cost estimates. They are designed to assist researchers in complying with the Institute of Education Sciences' (IES) SEER requirement to analyze the costs of educational interventions or, where relevant, costs compared to a control or comparison condition.

The guidelines are based on the emerging literature base on cost analysis in education (see bibliography) and on the CAP Project team's collective experience conducting cost analyses, reporting the results to practitioners and researchers, and reviewing IES grant applications. IES's Cost Analysis: A Starter Kit provides an introduction to key concepts in cost analysis. The *CAP Project Cost Analysis Standards & Guidelines 1.0* aim to support the execution of cost analyses.[2] These guidelines will be updated periodically and supplemented with additional tools at https://capproject.org/ to support cost analysis in education.

What is cost analysis?

Cost analysis is a systematic method for identifying and documenting the quantity, quality, and economic value of all resources required to implement a program in practice. This may include expenditures for new resources, such as student workbooks or digital devices, in addition to the opportunity costs of existing resources, such as classroom space or teachers' and the principal's time. Including all resources in the analysis allows for comparability of resource demands across programs, regardless of whether they must be newly acquired or reallocated from prior uses.

Methods for systematically conducting cost analysis in educational contexts have existed for more than 40 years, since the introduction of Levin's "ingredients method" (Levin, 1975; Levin, 1983; Levin & McEwan, 2001; Levin, McEwan, Belfield, Bowden & Shand, 2017). Hollands and Levin (2017) summarize four types of cost analysis and the questions they can help education decision-makers address. Cost-feasibility analysis (CFA) considers only the costs and viability of implementing a program while cost-effectiveness analysis (CEA), cost-benefit analysis (CBA) and cost-utility analysis (CUA) all consider academic and other returns in addition to costs, often comparing these across two or more programs. The CAP Project *Cost Analysis Standards & Guidelines 1.0* focus primarily on the estimation of costs rather than the returns on investment (effectiveness, benefits, utility).

Note that the term "cost analysis" is sometimes used to refer to economic evaluations that focus only on the estimation of costs (including CFA) and sometimes as an umbrella term for CFA, CEA, CBA and CUA. In these guidelines, it is used as an umbrella term and it is recommended that grant applications and study reports identify which specific type of economic evaluation is planned or has been conducted.

[1] In this guide, the term "program" refers to educational programs, interventions, activities, practices, and strategies.
[2] Reflecting current IES requirements, the CAP Project specifically supports the analysis of total and incremental costs/expenditures, cost-feasibility and cost-effectiveness analysis, but can suggest resources to support cost-benefit and cost-utility analysis.

Why conduct cost analysis?

Under the assumption that education decision-makers seek to maximize student outcomes within the constraints of finite resources, cost analysis can help decision-makers:

- Establish what resources are needed to implement a program with fidelity.
- Consider trade-offs between alternative programs.
- Assess whether resources are being distributed equitably to meet varying student needs.
- Balance costs against effectiveness, benefits, or utility of educational programs.

Key goals to keep in mind

Your cost analysis should be designed to:

- Help clarify how a theory of change is operationalized in concrete resource terms.
- Inform specific decisions about resource allocation, e.g., piloting, establishing, improving, replicating, scaling up, or eliminating specific educational programs.
- Provide generalizable information that can be reported out publicly and used by a broad audience to compare the results of your analysis to those of other cost analysts and to the costs of other programs to inform resource allocation decisions across programs.
- Complement implementation analysis and help clarify differences in treatment and comparison conditions of a study (treatment contrast) or differences in alternative implementation models being considered by an education agency.

Providing a Reference Case

To achieve the goal of providing generalizable and comparable cost information that can be used to inform resource allocation decisions across alternative programs, analysts should follow a common, standard set of methods, assumptions, and default values for key parameters - as described in these guidelines - to create a “reference case.” This recommendation follows the call by the Panel on Cost-effectiveness in Health and Medicine for a standardized reference case (Neumann, Sanders, Russell, Siegel, & Ganiats, 2016; Russell, Gold, Siegel, Daniels, & Weinstein, 1996; Siegel, Weinstein, Russell, & Gold, 1996; Weinstein, Siegel, Gold, Kamlet, & Russell, 1996) and by Robinson et al., (2019) for a reference case for CBA in global health and development.

CONDUCTING A COST ANALYSIS

The CAP Cost Analysis Guidelines are written in four stages:

- Stage I: Designing your Cost Analysis
- Stage II: Collecting Cost Data
- Stage III: Analyzing Cost Data
- Stage IV: Reporting Cost Analysis Results

Figure 1. Stages for conducting a cost analysis

Stage	Stage I: Designing your Cost Analysis	Stage II: Collecting Cost Data	Stage III: Analyzing Cost Data	Stage IV: Reporting Cost Analysis Results
Key Steps	1. Determine who is the audience for the results of the analysis 2. Specify what decision(s) this analysis can inform and timing of decision(s) 3. Determine what decision-makers need to know and what type of cost analysis can answer the question 4. Clearly define the program 5. Decide from whose perspective you will estimate costs (and returns) 6. Decide which stages of program development and implementation to include in your cost analysis	1. Determine the timing of cost data collection Document the resources needed to implement the program 2. Identify sources of data for type and quantity of resources needed to implement the program 3. Identify prices for your ingredients	1. Assign values to each resource 2. Adjust prices 3. Calculate costs 4. Categorize costs 5. Conduct sensitivity analysis	1. Identify context and assumptions to report 2. Calculate the cost metrics to report 3. Present the results

STAGE I: DESIGNING YOUR COST ANALYSIS

Note for IES applicants and grantees: The 2021 IES RFAs specify the type of cost analysis required for each project type. A summary table of these requirements is posted on the CAP Project Resources page.

The cost analysis design stage focuses on key questions to answer before collecting cost data. You need to:

- Determine who is the final audience for the results of the analysis.
- Identify the decisions the analysis will inform.
- Clearly define the program and its components.

This section provides guidance on how to address these areas to produce a well-designed cost analysis.

Determine who is the audience for the results of the analysis

Be sure to identify who can act upon the results of the cost analysis, ranging from the highest-level decision-makers to those who will implement any recommended action. These actors may include:

- Legislators
- Federal agencies
- State education agencies
- School board members
- District office cabinet members
- District office program directors
- School principals or other administrators
- Teachers
- Students
- Parents
- Funders
- Researchers

Specify what decision(s) this analysis can inform and timing of the decision(s)

Be clear about what questions your analysis can answer and what decisions the analysis can inform. For example, decisions your analysis could inform may include:

- Can the decision-maker afford to implement or scale up a specific program?
- Should the decision-maker scale back or eliminate a specific program? If so, at which sites?
- Which of several alternative programs should be implemented to maximize return on investment?
- Which of many budget requests merit funding?

Once you have identified the relevant decision(s) your analysis will inform, establish a realistic timeline to ensure the analysis will provide timely results:

- When will the decision be made?
- What factors affect the timing of the decision?

Determine what the decision-makers need to know and what type of cost analysis can answer the question

There are multiple approaches to understanding the resource requirements related to implementing a program or intervention. Table 1 summarizes of the kinds of information decision-makers may need and the relevant type of analysis to conduct.

Table 1. Information decision-makers may need about resource requirements and relevant analysis to conduct

Need resource information on …		Analysis to conduct
Costs of all resources involved in the proposed implementation/scale up including new and existing/reallocated resources	→	**Analysis of total costs**
New resource requirements or savings compared to business as usual	→	**Analysis of incremental costs**
New expenditures or savings only	→	**Analysis of expenditures**
Ability to afford implementation or scale up considering the costs to do so and budget available	→	**Cost-feasibility analysis**

Similarly, there are different ways to understand what is gained from an educational program, that is, the "returns." Table 2 indicates the kinds of returns that decision-makers are likely to be interested in and the relevant type of analysis to conduct.

Table 2. Returns and related analyses

Need information on…		Analysis to conduct
Academic returns (nominal increase/decrease in target outcomes) per unit of cost	→	**Cost-efficiency analysis***
Academic returns and costs compared with business as usual and/or compared to alternative programs	→	**Cost-effectiveness analysis (CEA)**
Monetized benefits	→	**Cost-benefit analysis (CBA)**
Usefulness of the program or stakeholder satisfaction	→	**Cost-utility analysis (CUA)**

**Note: Cost-efficiency analysis produces a cost per nominal output metric which, while a useful operational measure, is not a true cost-effectiveness ratio. It does NOT suffice for the IES CEA requirements which require a cost per unit increase in outcomes as determined by a rigorous effectiveness analysis.*

In practice, cost-efficiency analysis is very common when analysts are only able to identify the returns per unit of cost for an intervention, without a comparison condition or alternative interventions against which to compare. It is important to note that a cost-efficiency analysis is not a true cost-effectiveness analysis that considers the incremental returns per unit of cost for an intervention compared to business as usual and/or alternative programs.

Clearly define the program

A logic model or theory of change diagram is a useful starting point to clarify how a program is intended to work and what inputs and activities are critical. You will need additional details on these inputs and activities to inform the design and execution of a cost analysis. The following questions can help you gather these details:

- What are the activities involved including timing, frequency, dosage, and total length of program?
- What are the core components of the program?
- Where is the program implemented (setting)?
- Do you expect implementation to vary across sites or is it likely to be uniform?
- Who are the implementers?
- What are the characteristics of the target population (e.g., roles, grade level, demographics, performance levels etc.) and how many are served?
- Is the program delivered consistently across participants or does it vary substantially? If so, how?
- Over what time period(s) do you need to estimate costs (time horizon)?
- Is this a start-up situation or is the program already stable and in an ongoing “maintenance” or steady-state stage?
- What are the intended outcomes of the program? How and when are these measured?
- To what other programs, if any, are you comparing this program?
- Does the success of this program depend directly on some prior or follow-up activities by implementers or by those served (e.g., uptake of recommended resources/services)?

Note, it is important to distinguish between the service period for program participants and the number of years over which a program may operate continuously. For example, you may have multiple cohorts of students each participating for 1 year in a program which is funded for 2–5 years. Typically, costs of program implementation are estimated for the service period to reflect the costs of treating participants.

Decide from whose perspective you will estimate costs (and returns)

- **Societal:** This perspective includes all program-related costs regardless of who pays or contributes resources. This is strongly recommended for the reference case in all cost analyses to allow for a comparison of resource use by different programs.
- **Education agency implementing the decision:** This perspective includes only the subset of costs that accrue to the district, school, college system, state education agency, or intermediary organization implementing the program. This is recommended for the purposes of informing the decision motivating the analysis.
- **Participants:** This includes only the costs attributable to program participants. While costs accruing to participants will be included in the societal perspective, in some instances it is useful

to isolate them to help assess whether the program is worth the necessary time and effort from the participant's or client's point of view. Example: costs to students of attending college.

You may report costs from multiple perspectives but, for IES grants, we recommend a societal perspective and, where feasible, an education agency perspective.

Decide which stages of program development and implementation to include in your cost analysis

New programs begin with a development stage in which content, materials, training and processes are iteratively designed and often user-tested before implementation. Initial implementation is termed the "start-up" stage. Once program operation has reached a steady state, it is considered in an "ongoing" or "maintenance" stage of implementation. At this stage, it is common to evaluate the program for fidelity of implementation and/or for efficacy. As you design your cost analysis, you will need to decide which stages are relevant to include to address your research questions or to inform the decision being made. We indicate some considerations for which resources to include in your cost analysis:

Development stage: For research studies, it is only useful to publicly report resources used to develop a program if other implementers will incur them. If development costs will *not* be incurred when others implement the program, exclude those resources from your analysis. Or you may present these costs separately, for example, to report to the funding agency supporting the program.

Start-up stage: Resources needed to initially establish a program, advertise its existence, hire and train staff, and recruit or register participants should be included in your analysis if they will be needed by others implementing the program at a different location.

Ongoing/Maintenance stage: Resources needed to keep the program running are likely to be of most interest to other implementers. This is the key set of resources to document in your analysis.

Evaluation/research: If the evaluation or research is only conducted as part of a research study and is not required for effective implementation, do not include the resources used for conducting the evaluation or research. If the evaluation is used to provide ongoing feedback to implementers or to produce formative assessment data to guide implementation, include all or an appropriate percentage of these costs. Examples of resources used in evaluation and research include personnel time and materials for conducting classroom observations; administering and completing surveys, diagnostic assessments, summative tests, and impact assessments; analyzing data; and summarizing and presenting results.

A guiding question to help you determine which stages of program development and implementation to include is, "*In which of these activities would implementers elsewhere need to engage to replicate the observed outcomes?"*

Additional considerations for cost-effectiveness analysis

- CEA is intended as a comparative analysis to evaluate two or more alternative programs delivered at similar scale and targeting the same outcome and population. The goal is to assess which program is more cost-effective at achieving the desired outcome.
- To ensure comparability, outcome measures used to estimate effect sizes should be the same or similar across alternative programs being compared. Costs should be measured using the same perspective and a similar set of assumptions (i.e., a reference case) to ensure that differences in cost-effectiveness are attributable to meaningful differences in resource usage and/or effects, not merely differences in methodological choices.

- Standards for estimating effectiveness of educational programs when conducting CEA (and CBA) are the same as for efficacy, effectiveness or replication trials. This means you should employ rigorous experimental or quasi-experimental designs.
- For most IES grant-funded efficacy, effectiveness and replication studies, it is likely that you are only comparing one program against business-as-usual. If business-as-usual is also a single condition, you will produce a single cost-effectiveness (CE) ratio which reflects differences in costs and effects between treatment and control. This tells you what it costs to achieve the observed difference in outcomes which, in itself, is useful information. However, without an alternative program to evaluate, you will not be able to assess which one is more cost-effective. Possible ways to assess cost-effectiveness under these circumstances include the following:
    - If comparable programs have been studied by other analysts and reliable reports of costs and effects are available, you can use these results to assess how cost-effective your program is compared to the other programs. As the number of CEAs conducted grows over the next few years, finding suitable benchmarks against which to compare your CE ratios will become easier. This will be greatly enhanced by the application of common standards, common outcome measures[3] and presentation of a reference case.
    - If there is more than one comparable program being used in the control schools and your sample size is large enough to obtain effect sizes for each one, one could serve as a baseline and the other(s) could serve as a comparison to the treatment program in a CEA.
    - If no other comparable program is being implemented in the control schools and if there are no reliable reports of costs and effects for viable comparison programs, simply report a single CE ratio. You can suggest other programs against which it would be useful to compare your program.

[3] See SEER's Focus on Meaningful Outcomes and the IES Director's blog Making Common Measures More Common (Schneider, May 2020)

STAGE II: COLLECTING COST DATA

Once you have decided on the type of cost analysis you need to conduct and what programs, if any, are being compared, you can progress to collecting cost data. This stage involves deciding on timing of data collection, documenting the resources or ingredients needed to implement the program, and collecting prices.

Determine the timing of cost data collection

Your first step in collecting cost data is to determine from what timepoint you will collect the data:

- **Retrospective** –The program happened in the past.
- **Concurrent –** The program is happening at the same time you are collecting costs. This is the recommended approach whenever possible. Ideally, the cost analysis is integrated with evaluation of implementation.
- **Prospective –** You are anticipating costs of a program that will/may be implemented.

In all cases, you will need to choose the year(s) from which you will collect cost data and the year in which you wish to present results of your analysis to inform a decision. These may or may not be the same.

- If you are only estimating costs without considering returns:
  - Collect cost data from the most recent year available.
  - Choose a year for presenting results that is relevant to the decision being informed, often the current year.
- If you are matching costs to returns, you should collect cost data for the implementation year(s) from which the outcomes or other returns are estimated.
  - For example, for a retrospective analysis of a program implemented in 2016–17, use cost data such as time use and salaries from 2016–17. If you plan to present results in current year values, e.g., 2020, you will make inflation adjustments to the dollar values as described in Stage III, Analyzing Costs.
  - For prospective analyses, you can use current values of resources and adjust for inflation and time value of money in Stage III, Analyzing Costs.
  - For multi-year programs that vary in resource use year to year, you will collect cost data from each year of implementation. However, you will need to choose one year in which to express costs (and monetary returns) so that you can present costs in constant dollars.

Document resources needed to implement the program

The **ingredients method** developed by Henry Levin (see Levin & McEwan, 2001; Levin et al., 2017) is generally accepted as the standard approach for estimating costs of educational programs. It entails identifying all resources needed to implement a program and documenting information about them to allow assignment of an appropriate value. This section describes the data you will need to collect using the ingredients method.

- Data to be collected: type, quantity, percentage of use, and price of all resources used to implement a program over the time period of interest (see Appendix I for more details). For each item, collect the information shown in Tables 3-6 and enter it into your data collection tool, for example, an Excel or Google spreadsheet. There are four main resource categories to address:

- **Personnel**: Include all individuals who are involved in activities related to implementing the program. Document the amount of time each person spends on planning, administration, training, coaching, professional development, service delivery, monitoring, reporting, communication, and travel.
- **Materials and equipment**: Include consumable and non-consumable items used by implementers and program participants during the time period of interest.
- **Facilities**: Include spaces used to plan, train, deliver the program, or store materials.
- **Other**: Include other resources that have not already been captured in the first three categories. These may include both direct costs and indirect costs.
    - Examples of direct costs are transportation, conference or professional fees, travel costs, and technology fees.
    - Examples of indirect costs are overhead charges; building and technology maintenance and security; any separate charges for human resources, financial, administrative, legal, marketing and other support services.
    - Costs to participants or required client inputs such as parent volunteer or meeting time and parent-provided transportation.

- In addition to documenting resources that require outright expenditures, you will need to include **opportunity costs** of resources that have been reallocated from other purposes or contributed in-kind. This means assigning a value to the resource that represents its worth in its best alternative use. In practice, this means including the costs of personnel time spent on the program regardless of whether this time is already covered by a person's salary, is compensated with additional income, or is volunteered. This recognizes that the person's time could be compensated by wages commensurate with the role they play in the program. It also means including an appropriate portion of the costs of pre-existing facilities and equipment in recognition of the fact that, if they are being used for your program, they cannot be used at the same time for other purposes.
- Note that, unless you are only considering the participants' perspective, participant fees should be counted as transfer payments that alter the burden of who pays the costs, rather than as an actual cost.
- Exclude any resources and costs only associated with development or research unless you expect others to incur these costs when implementing the program.

Tables 3-6 are worksheets populated with examples of the types of data and information you will document in your own ingredients data worksheet. These data describe a few of the resources needed to implement an 8-week summer program at an elementary school. The sections that follow the tables suggest sources of data and provide questions to consider as you determine which resources to include and whether to document total (gross) costs of implementing a program or only incremental (net) costs compared to an alternative program or business as usual.

Table 3. Worksheet Tab 1: Program and Site Information

Name of program	Summer school
Year/s of implementation	2020
Period of time covered	July 6 – August 28, 2020
Length of program delivery	8 weeks
Place of implementation	Millbank Elementary School
Number of schools served	1
Geographical location	Boston, MA
Grades served	5th
Rural/urban/suburban area	Urban
Number of students/teachers served	50 students
Number of teachers implementing	2
Number of days in the regular school year	180
Number of hours in the school day	8

Table 4. Worksheet Tab 2: Personnel

Type of personnel and any qualifications needed	What do they do?	How many needed in this program implementation?	Amount of time spent on this program	Price/Source/ Year	Is this annual salary hourly/weekly rate?	Fringe benefit	How is this funded?	Funding status (existing/ reallocated, new expenditure, in-kind)
Elementary school (ES) teacher, 3 yrs experience, BA	Provide instruction 5 hours per day, 5 days per week during 8-week summer school; prepare lessons, grade assignments, 2-day training in advance; receive ongoing coaching	2 teachers	310 hrs each (5hrs instruction +2 hrs prep) x 5 dys x 8 wks +14 hrs training+16 hrs coaching	$40/hr Local salary schedule 2019-20	Hourly	53% of salary	50% Federal Title I; 50% District Office General Funds	New expenditure (current teacher but paid extra for summer school)
District literacy coach, 5 yrs experience, MA	Prepare and provide 2-day initial training to 2 ES teachers and ongoing 1-1 coaching twice per week for 1 hour each time	1 coach	60 hrs (14hrs training prep+14 hrs training delivery+(2hrs x 2 teachers x 8 wks coaching))	$56,000 Local salary schedule 260-day year. 2019-20	Annual	53% of salary	100% Federal Title II	Existing – already paid for full year
Parent/guardian volunteer	Assist with summer school classes by reading one-on-one with students	4 volunteers	80 hrs each (2hrs x 5dys x 8 wks)	$25,000 Equivalent salary of part-time teaching aide, 180-day year; Local salary schedule 2019-20	Annual	None	Parent	In-kind contribution from families

Table 5. Worksheet Tab 3: Facilities

Type of space	Details and use	How many needed in this program implementation?	How many hours per yr is this facility usable?	What % of usable time is facility used for this program?	How long does facility last before needing replacement (Yrs)?	Price/Source/Year	How is this funded?	Funding status (existing/reallocated, new expenditure, in-kind)
Elementary school classroom	900 sq ft per 25 students during summer school	2 classrooms, total 1,800 sq ft	1,440 (8 hrs per school day x 180 days this school is normally open per year)	9.6% (5hrs x 5 dys x 8 wks of summer school)/1,440	30	$362/sq ft Boston mid-price https://ccorpinsights.com/costs-per-square-foot/ 2019	100% District General Funds	Existing classroom

Table 6: Worksheet Tab 4: Materials & Equipment & Other

Item	Details and use	How many needed in this program implementation?	How many hours per year is this item usable?	What % of usable time is item used for this program?	How long does item last before needing replacement (Yrs)?	Price/Source	How is this funded?	Funding status (existing/reallocated, new expenditure, in-kind)
iPad	1 per student used 2 hrs/day in summer school but students keep year-round	50 iPads	4,380 (Assume students could use 12hrs per day x 365 days per yr)	2% (2hrs x 40 dys of summer school)/4,380	3	$329.00 [CDW]() National/local average 2020	100% school general budget	30 existing iPads, 20 need to be purchased new
AppleCare warranty	1 per iPad; 2 yrs	50 warranties	4,380 (See row above)	2%	2	$69.00 [CDW]() National/local average 2020	100% school general budget	30 existing, 20 need to be purchased

Identify sources of data for type and quantity of resources needed to implement a program

We recommend collecting information about type, role, and quantity of resources used from multiple sources. Possible sources include the following:

- Program documents and websites.
- Implementation guides (but beware that programs are rarely implemented as prescribed!).
- Evaluation reports from local districts or outside researchers.
- Interviews or emails with program developers, vendors, implementers, other school staff, program participants. See example interview protocol under **Additional Resources tab** in *CostOut*.
- Observations of training and implementation.
- Surveys of implementers.
- Time logs for key implementers.

Questions to help guide which resources to include in your cost estimate

It can be challenging to know which resources to include in your cost estimates. You should include all personnel, materials, and other resources needed to implement the program; but some may not be obvious. Here are some questions to consider:

- If you were going to replicate this program at a new site:
    - What existing resources do you need to reallocate to implement it?
    - What new resources must be acquired?
- Does the program use less of any resource than business-as-usual? (This can result in cost savings or averted costs).
- Are there any induced costs such as pre- or co-requisites that involve participation in other programs; or uptake of resources or services not provided by your program but necessary to produce the intended long-term outcomes?
- In cost analyses that include a consideration of the return on investment (CEA, CBA, CUA), are you inadvertently double-counting costs or effects?
    - For example, if a program reduces the number of students that need special education services, the savings should only be counted once, not once as a cost saving and again as a benefit.

Granularity of cost data

Resource use in education has not historically been documented at the level of the individual participant (e.g., student or teacher). This may be the result of an assumption that educational programs are uniformly delivered across participants in groups. Or it may simply be due to the absence of participant-level records. If, in practice, resource use varies substantially across participants (e.g., some students participate in the program for 1 year and some for up to 3 years), it may be worth estimating costs per student and investigating how this varies across sub-groups. If sub-group effect sizes are available, CE ratios can be calculated for each sub-group (relative to one serving as the baseline) to assess whether the program is more cost-effective for some sub-groups than others.

Total costs vs. incremental costs

Total costs (gross costs) of a program reflect the value of all resources needed to implement a program, regardless of whether they are being reallocated from an existing use or are being newly procured. Including the costs of all resources to estimate the total costs of implementation makes most sense when there is no existing program serving the same need, for example, if a school implements a new mental health clinic or introduces a summer program.

Incremental costs (net costs) are the costs of a program above or below the costs of business-as-usual or of a comparison program. Because incremental costs are relative, they can be positive or negative. To estimate incremental costs, you need to ascertain the differential amount of resources needed to implement your program compared with the alternative. For example, your program may need additional teacher time (positive cost relative to comparison) but fewer digital devices (negative cost relative to comparison).[4] Limiting the analysis only to resources beyond those associated with an already existing educational program to estimate incremental costs makes most sense when there is an underlying service on top of which you are layering an additional program, or if you are substituting existing services.

If your program is **supplementing existing activities**, you need only document the extra resources used and their costs in order to report incremental costs; there is no need to estimate the costs of regular instruction.

If the program is **substituting existing activities**, then you need the resources used and costs of both to figure out the difference.

If the program is **substituting several different activities**, you need to decide which one(s) you will use as the comparison. You may not have the capacity to estimate the costs of all the alternatives. If one is much more common than others, focus on that activity as the comparison. Otherwise, you can choose a sample of the different activities, estimate the costs of each and average them to serve as the comparison group costs. Another option is to choose the least resource intensive and most resource intensive alternatives in order to present the range of costs.

[4] To better understand the differences between total costs and incremental costs, see the resource *Calculating cost differences between programs* in the Additional Resources tab of *CostOut*.

For CEA and CBA you need:

1. Only incremental costs, i.e., the difference in resource requirements and costs between the intervention and comparison group practice. This aligns with effectiveness results or monetized benefits which are reported as relative to the control or other baseline condition.
2. Only the costs associated with the sample that is counted for a treatment-on-the-treated (TOT) effect size calculation, i.e., those participants who actually engaged in the program. If other participants are served by the program but were not included in the effectiveness analysis, fixed costs of the program should be spread across all participants served and only the appropriate portion of these fixed costs should be included in your TOT cost estimate.

Identify prices for your ingredients

For each resource, you will need a price in order to assign it a monetary value in the analysis stage. All resources have a value even if there is no expenditure required to acquire it for your program implementation. This value represents the opportunity cost of the ingredient.

National average prices: These are recommended for your reference case to allow for generalizability of results across locales and to allow for comparison with cost analyses of the same and other programs implemented elsewhere. For national average salaries, use a median when available to remove the influence of extremes. If a median salary is not available, the mean is the next best option.

Local prices: If it is helpful to local decision-makers, use local prices in a second analysis. These may be local average prices (e.g., average teacher salary for your metropolitan area), district averages, or actual salaries of relevant individuals. Local market average salaries for a particular position and associated qualifications are more reliable and generalizable than salaries of individuals which can be noisy, idiosyncratic measures. In addition, averages protect individual privacy.

Appendices II and III provide sources of national and local prices. Note that prices for materials and equipment obtained from national vendors are often the same for different locations in which case national price = local price.

STAGE III: ANALYZING COST DATA

Assign values to each resource

Once you have documented the full list of resources required to implement the program and identified prices, you need to assign an appropriate value to each ingredient before calculating costs. You can use templates, your own spreadsheets, or *CostOut* to derive these values and calculate costs. *CostOut* is designed to prompt users to derive values correctly by asking for quantity and percentage of time used. It is pre-programmed to accommodate adjustments for inflation, geographical location, and present value. It also facilitates amortization of durable assets where relevant (that is, spreading the costs of long-lasting items over their usable lifetimes).

For each resource, you should have established the following three metrics:

1. **Quantity:** Establish the quantity (number of units) of the resource required to implement your program. Example: 3 teachers.
2. **Percentage of usable time:** Determine the percentage of usable time this resource is used specifically for this program. Example: 20% of each teacher's time, or 5% of the time a laptop is available for use.
3. **Price:** Identify a national and, if appropriate, local price for each resource, and note the source. Example: $54,000 annual salary (180-day year) from a school district's 2017–18 salary schedule + fringe benefits of 27% of salary based on the school district's fringe benefits calculator.

In some instances, you will need no further adjustments before multiplying these three metrics to obtain the cost of each resource. However, some or all of the identified prices may need to be adjusted before calculating costs, as described in the next section.

Adjust prices

There are several reasons why you may need to adjust the price of a resource to obtain an appropriate value in the context of your cost analysis:

- The resource will be used across more than one year (amortization adjustment needed).
- The year from which you obtain the price is not the same as the year for which you plan to present the costs (inflation adjustment needed).
- The price does not represent the value of the resource in the location for which you are estimating costs (geographical adjustment needed).
- In multi-year programs, resources used in different years need to be assigned values relevant to the year in which a decision will be made (discounting to present value).

Whether you need any of these adjustments will depend on the types of ingredients your program uses, the prices you are able to obtain, whether the program lasts 1 year or more, and whether your analysis is concurrent, retrospective, or prospective.

Below, we provide more guidance and background on each type of adjustment along with example calculations. If you do not need to make any of these adjustments, skip to Calculate Costs.

Amortization: Consider whether the value of each resource should be spread over multiple years (amortized). “Straight-line amortization” involves producing an annual cost by simply dividing the value of the asset by the number of years the asset is useful for any purpose. This is a reasonable practice when interest rates are negligible, but standard accounting practices incorporate the opportunity cost of having funds invested in the undepreciated portion of the asset using the formula shown in Box 1. Some recommended guidelines for the number of years over which to spread costs of resources are as follows:

Resource	Lifetime over which costs are spread
Facilities costs based on construction prices	30 years
Furniture	10 years
Computer hardware	3 years
Personnel time for training/pd that is not repeated	3–7 years, or average personnel tenure
Personnel time for training/pd that recurs annually	1 year

Box 1. Amortizing resources over multiple years

Amortization

Amortization involves spreading the costs of an asset throughout its useful life while accounting for the opportunity cost of having funds invested in the undepreciated portion of the asset. An interest rate is used to calculate interest on the undepreciated portion. The amortization calculation yields an annual cost for the asset as follows:

$$\boldsymbol{Annual\ Cost = Replacement\ price\ of\ asset * \frac{r * (1 + r)^{l}}{(1 + r)^{l} - 1}}$$

l = lifetime of the asset
r = interest rate

e.g., if a building costs \$200,000 and you assume it will last 30 years, if you use a 3% interest rate, the annual cost will be:

\$200,000 * (0.03 * (1.03)^{30})/ ((1.03)^{30} – 1)

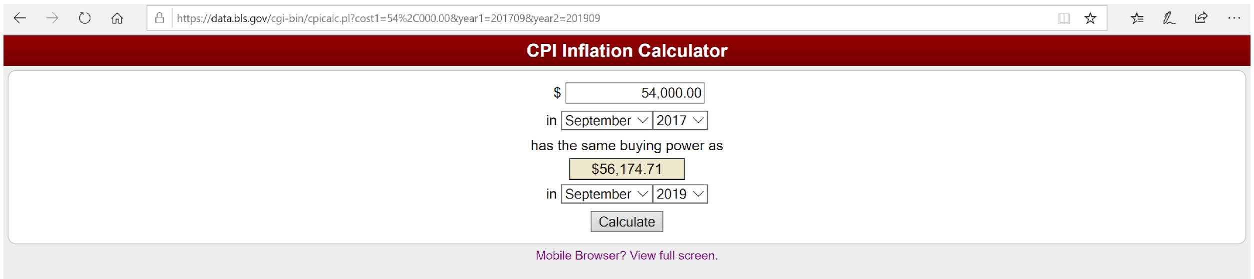
= \$10,204

Note: The equivalent formula to use in a spreadsheet is: =200000(0.03*(1+0.03)^30)/((1+0.03)^30-1)*

Inflation adjustment: If the year of the price you use is different from the year in which you want to express your cost estimate, you will need to adjust it for inflation so that all prices in your estimate are expressed in the same year. For your reference case analysis, we recommend using CPI-U from the Bureau of Labor Statistics (BLS). If you use *CostOut* for calculating costs, it automatically adjusts prices using CPI-U. You can also make these inflation adjustments using BLS’s easy-to-use inflation calculator. For example, if you have a teacher salary of \$54,000 from 2017–18 and wish to present costs for the year 2019-20, you could use the BLS calculator as shown in Figure 2 below to obtain a 2019–20 value of

$56,175. Box 2 shows the formula for inflation adjustments if you choose to build this into your spreadsheets.

Figure 2: Adjusting for inflation using BLS inflation calculator



Source: Screenshot from https://www.bls.gov/data/inflation_calculator.htm

Box 2. Formula for inflation adjustments

Formula for inflation adjustments
The formula used to obtain an inflation-adjusted price is: Inflation-adjusted price = Price x $\frac{\text{Index for the year in which you want to estimate costs}}{\text{Index for the year of the listed price}}$ The BLS indices for CPI-U are available here: https://www.bls.gov/regions/mid-atlantic/data/consumerpriceindexhistorical_us_table.htm Using the same example as above, if you start with a salary of $54,000 in September 2017 and want to adjust it to September 2019, the calculation is: $54,000 x (256.759/246.819) = $56,175

When estimating costs of resources that will be used in future years, the most straightforward approach is to express all prices in constant dollars in the same year. Even if you adjust future prices for anticipated inflation, once you complete the final analysis, the prices are normally deflated back to the base year for presentation of costs. However, you may need to apply an expected inflation rate to today's prices for ingredients used in the future if, for example, your organization applies standard annual increases to salaries, typically of 2–3%, or if you wish to present costs for future program years in terms of dollars in those years for ease of interpretation by your audience.

Geographical adjustment: Prices vary across states and between metropolitan and non-metropolitan areas. For your reference case, use national prices to improve generalizability of the analysis and usefulness of the results for a broad audience. Analyses to inform local planning might more usefully be based on local prices. If you cannot find a national or local equivalent for a price, you can use geographical cost indices or regional price parities (RPPs) (e.g., those provided by the Bureau of

Economic Analysis or NCES's experimental CWIFT index) to convert local prices to national prices or the reverse, using the calculation shown in Box 3 below. A national average price, by definition, has an RPP of 1.0. Locations with higher than average costs of living will have RPPs above 1.0 and those with lower than average costs of living will have RPPs below 1.0.

For example, if the $54,000 2017–18 salary used in the example above is from Sacramento City Unified School District, CA (SCUSD) and you need to convert this to a 2019–20 national average salary, you would divide the inflation-adjusted price of $56,175 by CWIFT's index of 1.073 for SCUSD to produce a national 2019–20 price of $52,353 ($56,175/1.073). Conversely, if you needed to convert a 2017–18 national average salary of $54,000 to a 2019–20 value appropriate for Beaverton Rural Schools, MI, you would multiply the inflation adjusted amount of $56,175 by CWIFT's index for this school district of 0.749 to produce a local equivalent salary of $42,075.

Box 3: Geographical adjustment calculation using Regional Price Parities

Geographical adjustments
The generalized formula for geographical adjustments is: $$\text{Adjusted price} = \text{Original price} \times \frac{\text{Regional Price Parity for area in which you want to estimate costs}}{\text{Regional Price Parity for geographical location of the price}}$$ Using the example from the text above, if you start with a local salary of $56,175 from SCUSD (RPP = 1.073) and wish to convert it to a national price (RPP = 1.0), the calculation is: $56, 175 x 1.0/1.073 = $52,353

Discount to present value: For multiyear programs, you need to consider the time value of money, i.e., the fact that (usually!) a dollar today is worth more than a dollar in the future. This reflects preferences for money now rather than in the future, uncertainty about the future, and the fact that a dollar owned today can be invested and earn interest. This is addressed by adjusting the value of future costs (and effects where relevant) to a "present value" using an interest rate that is termed the "discount rate." Theoretically, this is the interest rate the education agency implementing your program would need to pay to borrow money. It can be estimated as long-term interest rates represented by the yield on U.S. government bonds net of inflation. A standard real discount rate (the discount rate net of inflation) to use for the reference case is 3% (e.g., if the inflation rate is 2%, the nominal discount rate is 5% and the real discount rate is the nominal rate net of inflation, 3%). This should be varied in sensitivity analyses, for example, using a lower rate to reflect the current economic conditions. [Note that applying the same inflation rate and real discount rate to a resource for the same number of years would result in a "wash."]

Practically, if you are implementing a 3-year program and, at the beginning of Year 3 (i.e., in 2 years' time), you will need a resource that costs $100 in today's dollars, you would discount back to today using a 3% real rate in a present value calculation as shown in Box 4 below. If you would like to include anticipated inflation in the Year 3 price, you could inflate the Year 3 price by 3% a year and then add that 3% to arrive at a 6% nominal discount rate (3% real discount rate plus 3% inflation), and discount the inflated price of $106.27 back to both present value and today's dollars, arriving at the same answer.

Box 4: Discounting future values to the present

Present Value
The procedure to estimate a present value is called discounting. It is applied to resources that are used after the first year of the program. Their value should be discounted back to the first year of the program. The calculation for present value (PV) which includes compounded interest is: $$PV = P * e^{D*(1-Y)}$$ P = price of the resource Y = the year in which the resource was used D = the real discount rate *e.g., For a resource costing $100 today in Year 3 of the program* $PV = \$100 * e^{0.03*(1-3)}$ $= \$94.09$

*Note: The equivalent formula to use in a spreadsheet is: =100*EXP(0.03*(1-3)). A simpler formula, PV = P/(1+D)^Y, is often used for discounting, but this only discounts once per year rather than in continuous time.*

If you are evaluating a program retrospectively, for example, a 3-year program that began 6 years ago as of 2020 and thus ran from 2014–2016, you would first adjust for inflation to the year in which you'd like to express prices (e.g., adjust 2014, 2015, and 2016 salary information to 2020 dollars) and then discount costs in Years 2 and 3 of the program back to Year 1 (i.e., discount Year 2 costs by one year and Year 3 costs by two years).

Table 7. Adjustments for inflation and time value of money

Program Year	Calendar Year	Adjust for inflation…	Discount…
1	2014	Forward 6 years (to 2020)	No discounting
2	2015	Forward 5 years (to 2020)	Back 1 year (to Program YR 1)
3	2016	Forward 4 years (to 2020)	Back 2 years (to Program YR 1)

Calculate costs

Once you have made any necessary adjustments to the price of each resource (inflation, geographical, amortization, present value), you can calculate its cost as follows:

Cost of Resource = Quantity *x* % of Use *x* Adjusted Price

Sum the individual resource costs to produce the total costs of the program. For incremental costs, subtract the costs of each resource in the comparison condition from the costs of the same resource in the treatment condition. Sum these incremental costs to produce total incremental costs.

Categorize costs

When it is time to present your cost estimates, you will need to categorize costs in ways that are helpful to your audience(s). To provide useful information to decision-makers, consider categorizing costs in the following ways (1–3 are required for cost analyses conducted for IES projects funded in 2021):

1. **By "payer":** Using the information you collected about how each resource is funded, assign a percentage of each resource to the entity or entities which bear(s) the burden of its cost, e.g., school, school district, state education agency, local foundation, federal government, parents, families, or participants. In some cases, the resource may be funded by two or more sources, for example, an interventionist's salary may be 50% covered by Title I funds (payer is the federal government) and 50% by the local school district's General Funds (payer is the school district). Note that you may also separately analyze transfers from one payer to another. For example, if a school provides busing for an after-school program but charges parents a transportation fee, the cost is incurred by the school but the fee effectively "transfers" the burden of payment from the school to parents. It is important to recognize that the transportation fee itself is *not* an additional cost to society because it did not involve the use of any tangible resources, it is just an exchange of money. But if you present costs from the families' perspective, the fee would be a cost.
2. **By stage of implementation:** Indicate whether the costs are development, start-up or ongoing costs. If you include costs of research or evaluation that are not critical to implementation, label this category so that it is clear that these costs need not be incurred to replicate the program implementation.
3. **By year:** For multiyear programs, show costs for each year.
4. **By funding status:** Use the information you collected about funding status of each resource to assign a percentage of the cost of each resource to the following categories: existing/reallocated, new expenditure, in-kind.
5. **By fixed/variable/lumpy:** To help assess how costs might change if a program is scaled up or down, indicate whether each resource quantity is fixed, variable, or lumpy:
    - **Fixed** quantities do not change regardless of the number of participants in the program, e.g., the Assistant Superintendent of Curriculum & Instruction may spend 5% of her time supervising a program regardless of its size.
    - **Variable** quantities adjust up or down proportionally with the number of participants, e.g., in a one-to-one laptop program, the number of student devices will match the number of students.
    - **Lumpy** quantities increase in steps, e.g., an additional teacher may be needed once an additional 30 students are served.

Conduct sensitivity analysis

The credibility of the results of any analysis can be enhanced by addressing uncertainty. In cost analyses, this is achieved by conducting sensitivity analysis (see Boardman et al., 2017) in which you vary assumptions used in your main analysis (the "base case") about quantities, types of resources, prices, interest and inflation rates to demonstrate the implications of such changes. Ideally, the analysis would be presented in a manner that allows the end consumer the ability to vary key assumptions to reflect their own context. Practically, you can conduct such sensitivity analyses by duplicating your spreadsheets or *CostOut* projects and changing the assumptions being tested in the duplicated version.

STAGE IV: REPORTING YOUR COST ANALYSIS

In the last stage of your cost analysis, you will report the details and results of your analysis. This includes documenting details of the program implementation and listing all important assumptions made and parameters used in conducting the cost analysis. Transparency is important to allow your cost estimates to be replicated by others. You should provide a set of cost metrics that are useful to decision-makers and comparable with cost estimates of other programs. Utilizing visual representations can help your audience understand your results.

Context and assumptions to report

In your cost analysis report, include the following information about the program implementation and about the parameters relevant to your analysis:

Program and site information

- Name of program
- Year(s) of implementation
- Period of time covered
- Length of program delivery
- Place of implementation
- Number of schools served
- Geographical location
- Grades served
- Rural/urban/suburban area
- Number of students/teachers served
- Number of teachers implementing
- Number of days in the school year
- Number of hours in the school day

Cost analysis parameters:

- Type of analysis performed:
  - Total Costs
  - Incremental costs compared to a described condition
  - Expenditures only
    - CFA/CEA/CBA/CUA
- Comparison programs where relevant
- The year(s) from which you will collected cost data
- The year in which you are expressing cost results

- Type and sources of prices used (national averages, regional averages, local averages, local actual, etc.)
- Amortization assumptions (i.e., number of years over which durable resources are spread).

Cost metrics to report

We list below an array of possible cost metrics to calculate and report.[5] Best practice would be to calculate each of these metrics, but you may not have the resources to do so, or your audience or funder may not be interested in every metric. At a minimum, you should collect the data in a way that would make it *possible* for you or others to calculate each of these metrics:

- Total program costs using national prices - and local prices where useful to local decision-makers
- Incremental costs (or savings) compared to business-as-usual
- Average costs per participant and, where relevant, per school or site
- New expenditures as a subset of total costs
- Dollar amount and % of costs by:
  - Ingredient type (personnel, materials & equipment, facilities, other)
  - Payer (e.g., school district, state education agency, local foundation, federal government, parents/families, participants)
  - Fixed/variable/lumpy quantities
- For multiyear programs in which costs vary year to year, costs per year in dollar amounts and % of costs
- For each sensitivity analysis, report any changes to results.

For CEAs, additionally report:

- Cost-effectiveness (CE) ratios as the cost per unit increase in effectiveness (as opposed to effectiveness metric/costs) to emphasize the fact that decision-makers aim to maximize effects within their resource constraints.
- If you have more than one effect size, focus on reporting the metric that is most policy relevant and comparable to other programs, e.g., a metric based on a common outcome measure. For example, NWEA MAP or a standardized state test rather than a developer-made measure.
- If you have evaluated multiple interventions, rank them by cost-effectiveness.

Present the results

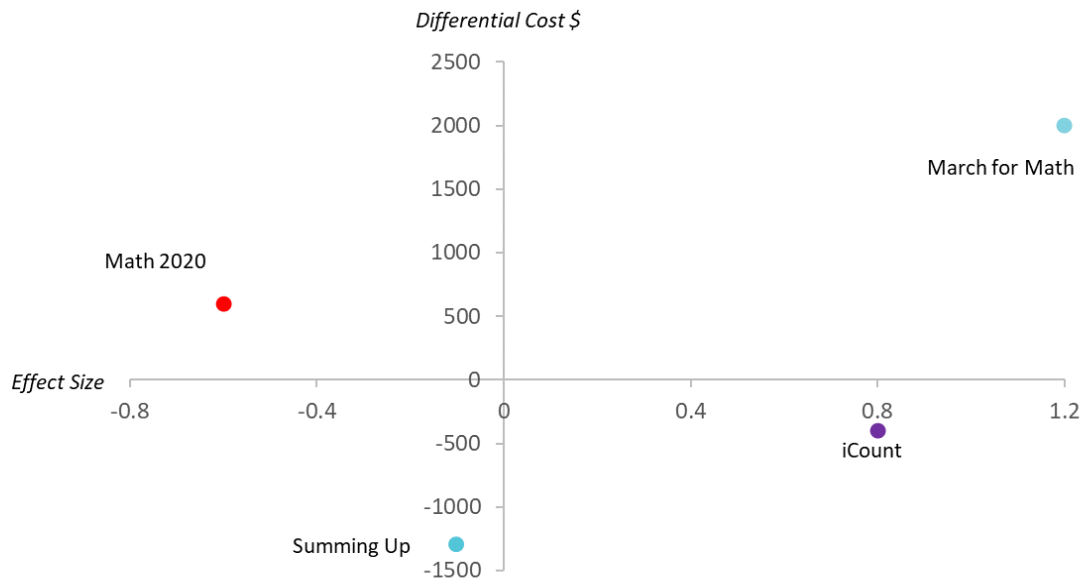
Charts and tables will make it easier for your audience to digest your results. Provide a full list of ingredients along with the information in Tables 4-6, shown previously. Add columns for price adjustments and final cost assigned to each ingredient.

The cost metrics listed above, effectiveness results and CE ratio(s) can be summarized and reported in tables, bar charts and pie charts.

[5] For 2021 IES grant applications, Initial Efficacy and Replication proposals require all of these metrics except for expenditures and fixed/variable/lumpy.

If you have several CE ratios, plot them on a CE plane as shown in Figure 3 (Black, 1990).

Figure 3: CE plane showing cost-effectiveness ratios for four hypothetical math programs



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APPENDIX I: INGREDIENTS DATA TO COLLECT

Personnel:

For all personnel who are involved in implementation of the program being studied, either directly or in a supporting or supervisory capacity collect the following information:

Job title

Required qualifications such as degrees, professional certifications or years of experience

How much time each person spends on the program

How these personnel are compensated

Turnover rates for key personnel, especially those who require extensive training

Training and professional development in which the personnel participated (as attendees, organizers or trainers) to facilitate program implementation and how often this must be repeated

- Time spent including any travel time
- Trainer fees if not salaried personnel
- Any compensation for training participants beyond their regular salaries, e.g., stipends
- Whether substitutes must be hired during training activities.

Facilities:

Type and size of space used for program implementation, training, storage, assessment activities etc.

Fees paid for rentals

Expected lifetime for owned space

Amount of time for which the space is used

Percentage of available time this represents (e.g., a classroom may be used for 2 hours per day out of 8 hours per day that it is available and this represents 25% use)

Equipment, materials, other:

Quantity, type and amount of time any equipment is used to implement the program

Expected lifetime

Type and quantity of consumable materials used and of miscellaneous items such as transportation costs, conference fees, insurance, professional fees etc.

Travel costs incurred and reimbursed for training/coaching/PD

For all items, it is important to document across how many program participants the resource is spread and also sources of funding.

For cost-effectiveness analyses that involve programs that substitute other activities, similar information must be collected for the comparison condition(s) to allow analysts to determine the difference in costs between the program and the comparison(s).

APPENDIX II: SOURCES OF NATIONAL AVERAGE PRICES

General

CostOut database of prices (this houses publicly available prices from several of the sources below)

Personnel Costs/Salaries – use median salaries when available, and next best is mean

- The Bureau of Labor Statistics' Occupational Employment Statistics national surveys:
- https://www.bls.gov/oes/current/oes_nat.htm
- National Industry-Specific Occupational Employment and Wage Estimates: Educational Services (shows public vs private schools)
- Bureau of Labor Statistics Occupational Outlook Handbook: https://www.bls.gov/oes/current/oessrci.htm#61
- https://www.bls.gov/ooh/occupation-finder.htm
- National Teacher and Principal Surveys: https://nces.ed.gov/pubs2019/2019141.pdf
- NCES: https://nces.ed.gov/programs/digest/d18/tables/dt18_211.50.asp?referrer=report
- American Association of University Professors: https://www.aaup.org/our-work/research/FCS
- U.S. Census Bureau Current Population Survey Tables for Personal Income: https://www.census.gov/data/tables/time-series/demo/income-poverty/cps-pinc.html
- OECD (2019), Education at a Glance 2019: OECD Indicators, OECD Publishing, Paris, https://doi.org/10.1787/f8d7880d-en.
- Value of volunteer time: https://independentsector.org/value-of-volunteer-time-2018/

Materials and Equipment

- General office supplies: https://www.staples.com/; https://www.bestbuy.com/
- Technology hardware: CDW https://www.cdw.com/content/cdw/en/about/overview.html
- School Nurse Supplies: https://www.macgill.com/products.html https://www.schoolhealth.com/about-school-health/

Facilities

- *CostOut* database of prices

Travel

- Lodging, meals, incidentals: U.S. General Services Administration: https://www.gsa.gov/travel/plan-book/per-diem-rates/per-diem-rates-lookup
- Mileage: Internal Revenue Service: https://www.irs.gov/tax-professionals/standard-mileage-rates
- Airfare: Bureau of Transportation Statistics: https://www.transtats.bts.gov/AIRFARES/

APPENDIX III: SOURCES OF LOCAL PRICES

Personnel Costs/Salaries

i. The Bureau of Labor Statistics' Occupational Employment Statistics surveys.
   - Statewide salaries: https://www.bls.gov/oes/current/oessrcst.htm
   - Local salaries (named metropolitan and non-metropolitan areas within states): https://www.bls.gov/oes/current/oessrcma.htm

ii. Publicly available salary databases provided by some state governments and school districts which list each employee by name, position, base salary and additional income for the current and past years. e.g. Jefferson County Public Schools, KY.

   http://openbooks.tylertech.com/_layouts/FormsBasedAutomatedLogin/loginOne.aspx?ReturnUrl=%2fjcps%2f_layouts%2fAuthenticate.aspx%3fSource%3d%252Fjcps%252FTransWebPages%252FPayroll%252Easpx&Source=%2Fjcps%2FTransWebPages%2FPayroll%2Easpx

iii. Salary schedules from district offices which list salaries by position type and may also include qualifications, years of experience, type and size of school.

   Search term to use in Google: "[Name of school district] salary schedule"

   e.g. Sacramento Unified School District Certificated Salary Schedule 2019-20 https://www.scusd.edu/sites/main/files/file-attachments/scta_salary_schedules_final_8.9.19.pdf

   San Francisco Unified School District https://www.sfusd.edu/information-employees/labor-contracts-and-salary-schedules

iv. Education agency human resources departments for information on fringe benefits and sources of personnel funding (e.g., General funds, Title I or II). Districts may have fringe benefit worksheet calculators.

v. State minimum wages https://www.ncsl.org/research/labor-and-employment/state-minimum-wage-chart.aspx#Table.

vi. Value of volunteer time by state https://independentsector.org/wp-content/uploads/2018/04/Value-of-Volunteer-Time-by-State-2001-2018-1.pdf

Materials and Equipment

- Price catalogues from local business and school supply vendors e.g. Kentucky-based Hurst Group https://shop.hurstgroup.net/Search?cri=Category%5E_2%5E_0%5E_Furniture%5E_Category%5E_True
  - School districts often have negotiated prices with certain vendors and even their own warehouses – ask program leaders at district office about relevant price lists.
- Can also use national suppliers listed in Appendix II.

Other

- Travel: School districts may have publicly available travel allowance policies.

Facilities

- Local rental prices for training spaces e.g., from hotel convention centers
- Local real estate agencies for rental or purchase prices
- Cumming for school construction costs per sq ft https://ccorpinsights.com/costs-per-square-foot/. We recommend uprating the cost per sq ft by 21% to include furniture[6], furnishing, fees, site preparation (but not purchase) as per College Planning and Management magazine Living on Campus June 2011. Use **Average Size of Educational Facilities** document in Additional Resources Tab of *CostOut* to obtain typical square footage of school spaces. Site purchase price would need to be added where relevant.
- National prices from *CostOut* adjusted to your geographical location.

[6] Note that furniture/furnishing/equipment (FF&E) included in construction costs are items like heating/cooling systems, vents, electrical and plumbing items etc. that produce a "finished space." Desks, chairs, cabinets, whiteboards etc. are not included.

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Other useful resources:

J-PAL website: Conducting Cost-Effectiveness Analysis (CEA) povertyactionlab.org/research-resources/cost-effectiveness

J-PAL Costing Guidelines: https://www.povertyactionlab.org/sites/default/files/resources/costing-guidelines.pdf

EEF Cost Evaluation Guidance: https://educationendowmentfoundation.org.uk/public/files/Evaluation/Setting_up_an_Evaluation/Cost_Evaluation_Guidance_2019.12.11.pdf