

Assessment of Learning Outcomes and Social Effects of Community-Based Education, Afghanistan (ALSE)

A Project by Professors Dana Burde (NYU), Joel Middleton (Berkeley), and Cyrus Samii (NYU)

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Cost effectiveness analysis

In this research brief, we discuss cost effectiveness analysis (CEA). We describe the purpose and general approach to CEA, discuss why it's important in impact evaluations, and provide information on ALSE's approach to CEA. Our "spotlight" features lessons learned from our ongoing cost effectiveness analysis.

What is cost effectiveness?

"Cost effectiveness analysis" shows how much a program intervention can achieve at what cost. There are two approaches to understand a program's cost effectiveness. First, if we have a fixed amount of money, CEA can help us determine the level of impact our intervention is likely to produce. For example, we might conduct CEA of a program that encourages teachers' attendance in order to understand the increase in *children's* attendance for each 100 USD spent. Second, we can measure the cost of an outcome that we would like to achieve. For example, we may be interested in how much it costs to increase students' test scores by a particular number of points. Regardless of the approach, cost effectiveness is expressed as the ratio of program costs relative to the program's effects on a given outcome. Programs typically influence a variety of education outcomes, but a strategy that is cost effective for increasing student access may not be cost effective for improving student learning, or vice versa. Thus, researchers need to coordinate closely with policymakers to identify the question of interest if they want a cost effectiveness analysis to yield a clear ranking across programs.

Why is cost effectiveness important?

Because resources are finite, policymakers typically try to implement programs that have the greatest gain for the lowest price. CEA helps with such decisions by allowing policymakers to identify the best way to allocate resources in order to achieve their objectives. For example, in 2013, the United States Agency for International Development (USAID) drew upon the ALSE precursor study by Burde and Linden

(2013)¹ to guide their decision to invest further in community based education in Afghanistan since this was found to be a relatively cost effective way to increase learning outcomes.

How to measure cost effectiveness

The formula for measuring the cost-effectiveness (CE) ratio for an intervention carried out at the village level:

$$\text{CE ratio} = \frac{\text{Cost per village} / \# \text{ of ITT individuals per village}}{\text{ITT effect}}$$

where "ITT" stands for "intention-to-treat." In other words, an ITT analysis includes all individuals eligible to participate in a program regardless of whether they took up the offer to participate. The "# of ITT individuals per village" is the average number of people eligible for the program per village. The "ITT effect" compares outcomes among those in eligible villages to outcomes among those in ineligible villages. For example, the ITT effect of a program that increases school attendance is the attendance rate for school-aged children in intervention villages minus the attendance rate for school-aged children in non-intervention villages. The ITT approach is important because the "ITT effect" is the impact that we can estimate directly from a randomized experiment. As a result, using the "# of ITT individuals" (rather than the number of individuals who took up the program) allows us to scale costs relative to the estimate of impact. Moreover, the ITT approach ensures an apples-to-apples comparison (rather than apples to oranges) across different programs that have varying rates of take-up.

The first step in calculating the cost-effectiveness ratio is to measure program costs per village. The standard approach is to use the "ingredients method" outlined by Dhaliwal et al. (2012)². In consultation with program implementers, the researchers identify all the components required to replicate the program. Then the researchers add the costs of these components. The second step is to divide this total cost by

¹ Burde, D., & Linden, L. L. (2013). Bringing education to Afghan girls: A randomized controlled trial of village-based schools. *American Economic Journal: Applied Economics*, 5(3), 27-40.

² Dhaliwal, I., Dufo, E., Glennerster, R., & Tulloch, C. (2012). *Comparative cost-effectiveness analysis to inform policy in developing countries: a general framework with applications for education*.

the number of individuals eligible to participate in the program. Lastly, this cost is expressed relative to the estimated ITT effect.

ALSE and cost effectiveness analysis

ALSE is measuring the cost effectiveness of four different CBE models implemented by CARE and CRS as part of the Community-Based Education Enhancement Program (CBEEP), with support from local communities.

1. Standard CBE program (teacher is from within the village and NGO implements standard community sensitization activities);
2. Teacher is recruited within the village and NGO augments standard community sensitization activities by promoting education-related Qur’anic messages and small scale adult learning programs;
3. An accredited teacher recruited (possibly from the outside the village if one is not available within) and NGO implements standard community engagement activities; or
An accredited teacher recruited from outside the village and NGO implements augmented community activities.

For each of these CBE models, we are measuring cost effectiveness ratios for school attendance and learning outcomes. We will have a total of eight cost-effectiveness ratios.

At this point, we have collected the following NGO-reported costs for the CBEEP “ingredients”: (1) NGOs’ direct and indirect staff; (2) classroom refurbishment costs; (3) trainings for teachers and shuras; (4) transportation; (5) supplies; (6) classroom rent; (7) teacher salaries; and (8) costs associated with community enhancement activities. The supply costs include items such as winterization kits, student kits, teacher kits, textbooks, math manipulative kits, and classroom books. We excluded high-level management costs incurred at the NGOs’ headquarters. These costs overlap heavily with the basic functioning of the NGOs, hence, they are not relevant if the MoE were to assume responsibility for the CBE classes.

The table on the right shows CBEEP’s average cost per village for the four CBE variations during the second year of the program.

The next steps for the researchers are: (1) to compute the average cost per village for each CBE model; (2) divide it by the number of children intended to be treated; and (3) estimate the effects of the CBE model on children’s school attendance and learning.

CBEEP average cost per village, irrespective of CBE model (THERE ARE ~ 1.1 CBE CLASSES PER VILLAGE).		
Cost Category	Average Cost per Class	% of total costs
Direct & Indirect Staff in Country	\$2,422	37.34%
Classroom Refurbishment	\$322	4.96%
Trainings for Teachers & Shuras	\$1077	16.60%
Transportation	\$1107	17.07%
Supplies	\$401	6.18%
Classroom rent*	\$237	3.65%
Teacher Salaries	\$815	12.57%
Enhancements	\$106	1.63%
Total per village:	\$6,486	100%

* The community donates classroom space. Although NGOs do not spend money for rent, we have assigned a market value to this donated good in accordance with the CEA methodology.

May spotlight: lessons learned from ALSE’s ongoing cost effectiveness analysis

Questions to ask when designing CEA based on the ongoing CEA being conducted by the ALSE team:

- How compatible are the accounting systems for an intervention and the particular method for CEA that will be used?
- How will you assign market value for goods and services that have been donated?
- Although understanding variations in cost effectiveness (for example, by geographic region) is useful in theory, can the more granular cost related data that these calculations require (such as varied components of staff time in different regions) be reliably and accurately collected?

ALSE Looking Forward

We present ALSE findings relevant to the new MoE education sector strategy.