ESTIMATING THE COST-EFFECTIVENESS OF EDUCATION PROGRAMS

A Case Study

Question 1: *Think carefully about all of the ingredients necessary to implement ATI—from materials, to personnel, transportation, and capital investments. Record the list in the space below.*

Answers will vary, but could include:

Salaries for ATs	Instruction materials for AT trainings	Instruction materials for classrooms
Salaries for instructors at AT Trainings	Transportation for ATs to trainings	Salaries for WGES personnel to monitor implementation

Question 2: *If you define a program as cost-effective if it achieves a total test score gain of at least 1.4 SD per $100 spent—how large does the average, per student impact of ATI-ASR need to be for it to be considered a cost-effective investment?*

$$1.4 \ SD \ per \ \$100 = \frac{\$100}{1.4 \ SD} = \$71.43 \ per \ additional \ SD$$

$$CE \ Ratio = \frac{Total \ Cost \ of \ Implementing \ Program}{Total \ Impact \ of \ Program \ on \ Specific \ Outcome}$$

$$\$71.43 = \frac{\$74,800}{(X \ SD * 12,000 \ students)}$$

$$X = 0.09 \ SD$$

Question 3: *Why do you think the impact estimate from **India** may or may not be a good approximation of the impact of the ATI-ASR intervention? Why do you think the impact estimate from **Kenya** may or may not be a good approximation of the impact of the ATI-ASR intervention?*

Answers will vary. Examples include:

The impact estimate from **India** may be a good approximation for the impact of ATI-ASR since the structure of the two programs was very similar. In both programs, struggling students worked with volunteers or community teachers for only a few hours per day. However, the program in India was during school hours, while ATI-ASR was after school hours. The program from India also relied on volunteers, who might be less effective than the paid ATs in West Ghanea. Alternatively, the volunteers could actually be more effective than the paid ATs if they were more motivated by their connections to the local community. The impact of the program in India was also evaluated at the end of the second year, which means that it might be higher than the impact of ATI after just one year.

The impact estimate from **Kenya** may be a good approximation for the impact of ATI-ASR because the context of the two programs is likely more similar than the context in India. Additionally, to divide the class by ability level, the program in Kenya used paid contract teachers, who are more similar to the ATs used for ATI-ASR. However, the program in Kenya separated students by ability for the entire school day, while in ATI-ASR, struggling students work with the ATs for only a few hours per day after school hours. Additionally, the impact of the Kenya program was measured after 18 months, while the impact of ATI-ASR was measured after only a year.

Question 4: *Based on the impact estimates from the comparable programs presented above, calculate a range of potential cost-effectiveness.*

Table II: Estimated Cost-Effectiveness of ATI-ASR		
Estimated cost per child per year of ATI-ASR	$6	
	Remedial tutoring by volunteers, India	**Tracking students by ability, Kenya**
Estimated impact per child per year of ATI-ASR	0.28	0.18
Estimated cost-effectiveness of ATI-ASR	$23.09 per additional SD or 4.33 SD per $100	$34.62 per additional SD or 2.89 SD per $100

Question 5: *How would you explain what this estimated range of cost-effectiveness means to your colleagues at WGES? Does this predict exactly how cost-effective ATI-ASR will be?*

Based on prospective costs and similar programs evaluated in different contexts, it is feasible that ATI-ASR may improve test scores by between 2.89 SD and 4.33 SD per $100 spent (or cost between $24.09 and $34.62 per additional SD). The cost-effectiveness of ATI-ASR will likely be within this range, provided that the program is implemented according to plan, with roughly the expected budget. You should be sure to emphasize that this range does **not** predict <u>exactly</u> how cost-effective ATI-ASR will be in West Ghanea.

Question 6: *Are there any potential risks or uncertainties that that could make ATI-ASR not cost-effective? In your opinion, what are the most important assumptions that must hold true to make ATI-ASR cost-effective?*

There are always uncertainties and risks when implementing a program that could affect that program's cost-effectiveness. For example, we are assuming that implementers will be able to find qualified individuals to serve as ATs for the salary offered. We are also assuming that the planned training will be sufficient to enable the ATs to work with struggling students. There are many other assumptions about how we expect ATI to impact students' learning, and what we expect to spend on ATI that can be listed here.

Question 7: *Use Table V to fill in the blue boxes in Table VI below.*

Table VI: Costs for ATI-ASR

Demographics	Pilot
Number of ATs employed	162
Number of schools	100
Number of students in Standards 1-3	12,000
Duration (in years)	1
Exchange Rate (USD/WGHS)	0.51

Cost Source	Cost Category							Currency Units	Total Cost
IPA Budgets	1	Start-up & Overhead						2011 USD	5,152.00
WGES Program Documents & Budgets	2	Refresher Training for Master Trainers						2011 USD	591.54
	3	Training of Circuit Supervisors, WGNAT, NYEP and Other WGES						2011 USD	2,158.94
	4	Training of SMCs						2011 USD	4,962.80
	5	Master Trainer Training						2011 USD	3,561.84
	6	Training of Trainers						2011 USD	4,191.40
WGNAT Documents & Budgets	7	Training of Assistants/Teachers						2011 USD	9,745.24
	8	Back up Training and Training for replacements						2011 USD	9,745.22
IPA Budgets	9	Monitoring Training						2011 USD	5,819.67
	10	Instruction Materials							

			Item	Unit Cost, Local	Local Currency	# Sets Per School	Total # Sets Needed	Total Cost, 2011 WGHS		Total Cost, 2011 USD
		10.1	Sentence Cards	**1.73**	2011 WGHS	3	300	519	2011 USD	265.81
		10.2	Paragraph Cards	**2.07**	2011 WGHS	3	300	621	2011 USD	318.05
		10.3	Word Cards	**1.84**	2011 WGHS	3	300	552	2011 USD	282.71
		10.4	Letter Cards	**1.98**	2011 WGHS	2	200	396	2011 USD	202.82
Packing slips from IPA			…							
			Total Cost of Instructional Materials						2011 USD	20,369.49
WGES Budgets	11	Supplies & Equipment						2011 USD	2,830.50
IPA Budgets	12	Monitoring						2011 USD	4,833.47
NYEP Budgets	13	ATs Salaries						2011 USD	65,520.00
TOTAL COSTS, ATI-ASR*									139,482.13

* Dummy numbers

Question 8: *Now that you have the actual costs of the program, please calculate a more accurate cost per child.*

Table VII: Actual Costs of the ATI-ASR

What was the total cost of ATI-ASR?	$139,482
How many students did ATI-ASR reach?	12,000
What was the cost per child per year?	$11.62

Question 9: *With both the cost and impact information, please calculate a retrospective estimate of the cost-effectiveness of the intervention and fill Table VIII.*

Table VIII: Actual Cost-Effectiveness of ATI-ASR	
Actual cost per child per year of ATI-ASR	$11.62
Actual impact per child per year of ATI-ASR	0.190 SD
Actual cost-effectiveness of ATI-ASR	$61.16 per additional SD -or- 1.63 SD per $100

Question 10: *How would you explain this cost-effectiveness estimate to your colleagues at WGES? How is your explanation and interpretation of this estimate different from the prospective calculation?*

ATI, as it was implemented in West Ghanea as a pilot, led to a 1.63 SD increase in test scores per $100 spent (or cost $61.16 per additional SD).

Since we have based this cost-effectiveness ratio on an impact estimate from ATI and actual cost data, we can interpret this estimate with much more confidence. However, when explaining this to your colleagues at WGES, be sure to emphasize that this estimate will not predict how cost-effective all programs like ATI will be in other contexts. It will also not predict how cost-effective ATI will be when implemented at-scale, across West Ghanea.