
MEMORANDUM**TO:** Rebecca Tunstall**FROM:** Randall Blair, Alexander Persaud, and Larissa Campuzano**DATE:** 3/19/2010
ESVED-231**SUBJECT:** Baseline Comparison of Middle School Data

EXECUTIVE SUMMARY

This memo presents baseline analyses for the impact evaluation of the middle school strengthening activity of the MCC-funded Human Development project in El Salvador. In our analysis of key measures of employment, income, and educational attainment, we find that students who attended the 20 schools selected for this activity are very similar to students who attended the 20 schools in the comparison group. Given the small number of statistically-significant differences between treatment and comparison schools, we can conclude that our matching procedures produced an internally valid comparison group.

A. Background

Under the Formal Technical Education sub-activity of the Human Development project, the Millennium Challenge Corporation (MCC) is providing support to strengthen 20 selected general and technical middle schools in key municipalities in the Northern Zone (hereafter referred to as the “strengthening activity”). This support includes improving the array of degree granting and non-degree granting vocational training and skills courses for youth; training teachers in the use of advanced instructional technologies; linking formal education with private sector needs; making capital improvements (laboratories and workshops); and purchasing needed equipment. According to FOMILENIO, over 9,000 students are expected to benefit from these activities, which will be implemented from 2009 to 2012 (MCC-El Salvador Compact, 2006). The intervention will benefit students from both the general and technical specializations offered by the middle school.¹ These actions intend to improve enrollment, continuation, and graduation rates in participating middle schools. The final goal of the intervention is to improve the incomes and employment opportunities of youths in the Northern Zone.

MCC has contracted Mathematica Policy Research to design and conduct the impact evaluation of the middle school strengthening activity. The objective of the evaluation is to answer the

¹ Technical middle schools in El Salvador serve grades 10, 11, and 12. These middle schools could offer two types of degrees: general (for which the students need to complete grades 10 and 11); and technical (for which the students need to complete grades 10, 11, and 12).

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following research question: What is the impact of strengthening 20 technical middle schools on students' educational and labor market outcomes? Based on extensive consultations with MCC, FOMILENIO, and El Salvador's Ministry of Education (MINED), we chose a *matched-comparison design* as the final evaluation design for the strengthening activity. This is a quasi-experimental design in which the 20 middle schools selected for the intervention were matched to 20 schools with similar demographic characteristics.² In this memorandum, we use survey data to verify that students who attended the 20 middle schools selected for the intervention (or "treatment schools") are statistically similar to students who attended the 20 middle schools in the comparison group.

B. Data Source and Data Collection

To measure income, employment, and post-secondary educational outcomes not available in MINED's administrative data files, Mathematica worked with the Consortium for International Development in Education (CIDE) to design and administer the baseline Encuesta de Seguimiento de Estudiantes (ESE). The survey instrument was comprised of the following five sections:

Prefix	Section Title
A	Background Information
B	Employment Characteristics
C	Sources of Income
D	Job Search
E	Subsequent Education

With some oversight from Mathematica, CIDE personnel administered the baseline ESE to over 500 youths in 9 departments in El Salvador's Northern Zone from October 2009 to December 2009. The target sample size for the baseline ESE survey was 600 students (15 students from each of the 40 schools in the sample) who attended their last grade of middle school in 2008. CIDE interviewed 521 out of these 600 students, for a completion rate of 87 percent. CIDE personnel conducted more than 40 percent of interviews by telephone. The remaining interviews were conducted in-person at students' schools, homes, or another location in their community. Phone

² MINED identified 75 middle schools in the Northern Zone that were eligible to receive the intervention. FOMILENIO contracted CIDE's services to develop the criteria on which 20 of the 75 technical middle schools would be selected for the intervention. Once FOMILENIO, MINED, and CIDE agreed on the final criteria, CIDE constructed a ranking score for each of the 75 eligible schools. A high ranking score reflects that a school demonstrated a high level of need according to the selection criteria, while a low score reflects that a school demonstrated a low level of need. Once FOMILENIO selected the 20 middle schools that would receive the intervention, Mathematica used propensity score matching to identify a comparison group of 20 schools among the 55 schools not selected for the intervention. These 20 schools had school-level characteristics that were most similar to those of the intervention group.

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interviews lasted between 10 and 30 minutes, and most in-person interviews lasted no longer than 20 minutes.

A data quality review conducted by AENOR Centroamérica evaluated the ESE survey instrument, training procedures for the survey, as well as CIDE's data collection and quality control procedures. AENOR gave a score of 100 out of 100 possible points for the quality of the survey instrument, survey materials, and sampling frame. In addition, AENOR gave a score of 64.3 out of 65 possible points for all training, data collection, and quality control procedures related to the survey. Given these high scores, Mathematica is satisfied that the baseline ESE data is of high quality.

C. Findings

Background Information. To determine whether youths from treatment schools are demographically similar to youths from comparison schools, we compared their age, average family size, gender, and middle school program type (Table 1).³ We detected only one significant treatment-comparison difference for these variables: youths from comparison schools appear to have larger families than youths from treatment schools (4.6 average family-members versus 4.0 in treatment). The only other substantive (although non-significant) difference between treatment and comparison is that youths from treatment schools are more likely to have attended technical programs (57 percent versus 50 percent in comparison).

Table 1. Background Information (Percentages Unless Otherwise Indicated)

Description	Treatment	Comparison	Difference	<i>p</i> -Value
Female	60	63	-3	0.54
Average age (Years)	19.2	19.3	-0.1	0.76
Average family size	4.0	4.6	-0.6	0.02*
Middle school program				
General	43	50	-8	0.17
Technical	57	50	8	
Sample Size	258	263		

Source: Encuesta de Seguimiento de Estudiantes (ESE) interviews conducted from October to December 2009.

Note: * Significant at 0.05 levels.

³ All estimates reported in this document's tables are weighted using the sampling weight adjusted for non-response.

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Employment measures. Around 40 percent of youths from treatment and comparison schools report being employed and having worked in the last week (Table 2). Slightly more youths from comparison schools report having fixed work (24 versus 20 percent for treatment). On average, youths from comparison schools also report working more days and hours per week (2.3 and 16.6, respectively) than youths from treatment schools (2.1 and 15.8, respectively). However, none of these differences is statistically significant.

Table 2. Key Employment, Income and Education Outcomes (Percentages Unless Otherwise Indicated)

Description	Treatment	Comparison	Difference	<i>p</i> -Value
Employment				
Currently employed	39	41	-2	0.77
Worked in last week	37	39	-2	0.68
Has fixed work	20	24	-4	0.40
Average days worked per week ^a	2.1	2.3	-0.2	0.54
Average hours worked per week ^a	15.8	16.6	-0.8	0.79
Income				
Respondent's average monthly income from formal employment ^a	\$67	\$56	\$10	0.50
Respondent's average total monthly income ^{a,b}	\$117	\$110	\$7	0.72
Average annual household income, (excluding respondent's income from formal employment) ^c	\$3,206	\$3,098	\$108	0.95
Average total annual household income ^d	\$4,111	\$3,866	\$245	0.89
Graduation				
Formally graduated	92	90	2	0.54
Passed all classes	96	95	1	0.70
Passed PAES exam	87	82	5	0.26
Post-Secondary Education				
Currently studying	40	36	4	0.54
Currently studying in a formal area	37	35	3	0.66
Sample Size	258	263		

Source: Encuesta de Seguimiento de Estudiantes (ESE) interviews conducted from October to December 2009.

Notes: ^a These values are unconditional, meaning that youths that reported not working were given values of 0 for days and hours worked per week, as well as values of \$0 for monthly income from employment.

^b Total monthly income includes the respondent's share of any household income from wages, remittances, public assistance, rents or other sources.

^c Includes all household income from wages, remittances, public assistance, rents or other sources.

^d Includes respondent's income from formal employment.

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Income measures. Monthly income from employment is similar between youths from treatment and comparison schools (Table 2). Youths from treatment schools report slightly higher monthly income from employment (\$67 versus \$56 among youths from treatment schools). This difference is interesting, given that youths from treatment schools report working slightly less days and hours per week than youths from comparison schools.⁴ Youths from treatment schools also have slightly higher total monthly income than youths from comparison schools (\$117 versus \$110), as well as slightly higher total annual household income (\$4,111 versus \$3,866 among comparison youths). Because none of these differences is statistically significant, we consider treatment and comparison groups well matched on all key income measures.

Education measures. Overall, the treatment and comparison groups have similar educational outcomes. Youths from treatment schools are about as likely as youths from comparison schools to report having finished classes and graduating from middle school. However, treatment youths are slightly more likely than comparison youths to report having passed the PAES exam (87 percent versus 82 percent of comparison youths). Treatment youths are also slightly more likely to continue studying after middle school (40 percent versus 36 percent among comparison youths). Just as in the case of employment and income indicators, however, none of these differences is statistically significant.

D. Discussion

As illustrated, the treatment and comparison groups exhibit minimal substantive differences across employment, income, and education measures. The only notable (although non-significant) difference between treatment and comparison is the portion of youths that attended technical programs (57 percent from treatment versus 50 percent from comparison). This difference—which reflects key selection criteria for the middle school strengthening activity—can be mitigated by using statistical controls during impact analyses. Given the small number of statistically-significant differences between treatment and comparison schools, we can conclude that our matching procedures produced an internally valid comparison group.

Mathematica's next deliverable for the middle school evaluation is a similar comparison of the 20 schools in the treatment group and the 20 schools in the comparison group through an analysis of administrative data provided by MINED. The analysis will compare treatment and

⁴ This discrepancy may be explained by the different types of employment reported by youths from treatment versus youths from comparison schools (see Table A1). Youths from treatment schools are more likely to be salaried employees, while youths from comparison schools are more likely to work for relatives in paid and unpaid arrangements.

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comparison schools on the following indicators: (1) enrollment, (2) grade completion, (3) continuation in school, (4) academic achievement, and (5) middle-school graduation.⁵

Although the contract for Mathematica's evaluation is scheduled to end in 2012, stakeholders considered it important to obtain post-intervention data from students that will have completed the three years of technical middle school under full implementation of the intervention. Thus, FOMILENIO and MCC decided to collect labor market and post-secondary outcomes from a survey to be conducted in 2013 that will focus on middle-school students registered in their last year of middle school in 2012.⁶ These data can be analyzed in conjunction with ESE baseline data to determine the impact of the middle school strengthening activity on students' employment, income and subsequent education.

cc: L. Moreno, M. Induni, File

⁵ Unfortunately, MINED has not yet provided us with these administrative data. We estimate that we can complete the analysis one month after we receive the data.

⁶ This group will include students in the technical track registered in 12th grade in 2012, and students in the general track registered in 11th grade in 2012.

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Table A1. Additional Information from Employed Respondents (Percentages)

Description	Treatment	Comparison	Difference
<i>Type of employment</i>			
With relative (paid)	7	20	-13
With relative (unpaid)	8	18	-10
Permanent salaried	41	30	11
Temporary salaried	26	14	12
Other	18	18	0
<i>Occupation</i>			
Merchant	23	38	-15
Domestic servant	7	14	-7
Secretary	5	6	-1
Farmer/Agro-industrial	11	14	-3
Other	55	29	26
<i>How respondent found work</i>			
Through a friend/family member	81	82	0
Newspaper advertisement	4	1	3
Own initiative/business	10	4	6
Work is primarily at home or at a relative's home	1	6	-5
Other	3	7	-4
Sample Size	95	84	

Source: Encuesta de Seguimiento de Estudiantes (ESE) interviews conducted from October to December 2009.