



Concentrating efforts on low-performing schools: Impact estimates from a quasi-experimental design

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ARTICLE INFO

Keywords:

Multi-level intervention
Regression discontinuity
Program design and implementation

JEL classification:

C29
C26
I21
I28
I29

ABSTRACT

This paper presents the impact evaluation results of the Colombian program *Todos a Aprender (Everyone Learning Program, ELP)*, a multi-level intervention targeting low-performing schools. The main objective of the program was to increase math and language test scores of these schools through on-site teacher training, principal training and textbooks for students. Using census data from public schools containing detailed longitudinal information since 2010, the starting year of the program, and taking advantage of targeting rules based on dropout and grade repetition rates we fit a fuzzy regression discontinuity design to estimate program impacts. We also fit a difference-in-difference matching model as well as blocking with regressions to estimate the ATT impact of the program, based on observed characteristics used in the targeting process. Overall results indicate no significant impact of the program on test scores, grade repetition nor dropout rates. Additional analyses from a representative sample of 400 schools collected in the field suggest that deficiencies in the program's design and implementation could explain the lack of significant program impacts.

1. Introduction

The growing availability of international information on education shows two global trends in developing countries. First, most countries have achieved important advances in enrollment rates, particularly in primary education. Second, despite these advances, the overall gains in student learning, as measured by standardized test results, have been at best modest or null (Glewwe, Hanushek, Humpage, & Ravina, 2013; Pritchett, 2013). To meet the dual challenge of increasing access to education and improving learning outcomes, governments are implementing policies to tackle education from either the demand or supply side (Kremer, Brannen, & Glennerster, 2013; Murnane & Ganimian, 2014).

Most of the interventions addressing the supply side attempt to change specific aspects of a school; for example, by equipping them with computers or providing teacher training. On the other hand, a less common supply-side intervention – referred to as “multilevel interventions” (Snilstveit et al., 2015) – attempts to address more than one barrier for school quality improvement. These programs use a combination of interventions that in most cases include materials, teacher

training, and infrastructure improvement. In some cases, these also include additional interventions, such as management training, school feeding, and diagnostic feedback. Evidence for the causal impacts of these type of interventions is limited. In a recent study, Snilstveit et al. (2015) identify only six studies that evaluated the impact of interventions that combined materials, teacher training, and management training in five low- and middle-income countries (Jamaica, Uruguay, Chile, Colombia and Mexico), finding mixed results on dropout rates and math and language test scores.

This paper contributes to the existing body of knowledge by presenting causal evidence of the impact of the *Everyone Learning Program (ELP)*,¹ a multilevel intervention designed and implemented by Colombia's Ministry of National Education (MNE) since 2011. Likely constituting the most important program in the educational sector in the country in recent years, the basic goal of the program is to improve standardized test scores of primary education students attending public schools. The ELP, like most multilevel school interventions, focuses on the lowest performing schools in the country and aims to strengthen inputs in the educational process through the program's three main components: providing teacher training to improve teachers'

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¹ In Spanish, the name of the program is *Programa Todos a Aprender (PTA)*.

pedagogical practices, providing training to principals to improve school management, and providing educational materials to students and teachers. Between 2011 and 2014, the ELP was implemented in more than 4,000 public schools across the country, reaching 77,086 teachers and nearly 1.9 million primary school students.

We use rich administrative data for the years 2009 to 2014 to evaluate the short-run impact of the program. By merging five administrative datasets, we construct a school panel data base that contains information for all public schools in the country. This information includes school characteristics such as location, number of students, number of teachers and schedules offered, as well as educational outcomes such as dropout and grade repetition rates, and the average test scores in math and language attained by their students in third and fifth grade. Additionally, we collected data from the field for this evaluation from a representative sample of 400 PTA-eligible schools in 2014. This data provides rich information about the actual implementation of the program, including the frequency of school visits and the type of activities performed as part of the intervention, and suggests the likely channels through which the results found in this paper can be explained.

To obtain a causal estimate of the ELP's impact, we exploit the discontinuity in the probability that a school would enter the program. The ELP focuses on the most underachieving schools, using four types of continuous variables to measure underachievement: the rate of grade repetition and student dropout, the variation in school enrollment, and standardized tests scores. By using these characteristics, we build an achievement index that allows us to employ a regression discontinuity design to evaluate the impact of the program on the probability of student dropout and grade repetition, and on student learning in the areas of language (Spanish) and mathematics around the cutoff point for program eligibility.

The results we obtain from the regression discontinuity design (RD) suggest that the program's impact on the quality and efficiency indicators in benefited schools is close to zero. These results are robust to different model specifications and cutoff points of program entry, as well as the use of different school samples. In general, the results do not allow us to reject the null hypothesis that the ELP has had no impact on rates of grade repetition and dropout, and on measures of educational quality obtained by students on standardized tests in mathematics and language.

The absence of a significant impact under the RD design could be attributed to the local character of the estimator. It is possible that, under heterogeneous effects, schools near the cutoff point for program entry fail to present evidence for program impacts. It is also possible to argue that treated schools further from the cutoff point, which would be the most underperforming schools, have benefited from the ELP. To test this hypothesis, using a larger sample, we estimate the average impact on the treated schools under difference-in-difference matching models as well as matching under blocking with regressions (Imbens, 2015). The results are consistent with those obtained from the RD design. On average, the DD-matching and blocking models show no impact of the program on dropout, grade repetition, or standardized test scores for this broader sample of schools.

One plausible explanation for these (null) results is that not enough time has elapsed to observe effects in educational quality and efficiency rates, and any impact evaluation of the program needs to be executed later in time. Alternatively, deficiencies in the program design or implementation could explain, in part, our results. Additional analyses carried out with information from a complementary representative sample of 400 eligible schools collected in the field suggest that, although the program has impacted some short-term variables related to teaching practices, deficiencies in the program design and implementation might be the main explanation behind the lack of significant program effects. We find that the number of yearly individual meetings of beneficiary teachers with their tutors was very low and far below what was originally planned. The mean number of visit per year

for teachers in our sample was 3, while the programme foresaw one visit per week. Furthermore, in these few sessions, no evidence of a clear structure of core activities undertaken is present.

The contribution of this study to existing knowledge about the causal effects of multilevel interventions is twofold. Firstly, through the causal identification strategy, we show that the positive effects previously found for similar programs in Chile (Chay, McEwan, & Urquiola, 2005) and Uruguay (Cerdan-Infantes & Vermeersch, 2007), do not extrapolate to other contexts. The evidence suggests that ELP has had no short-term impact on educational outcomes of the benefited students. Secondly, the evidence also highlights the importance that appropriate program design and implementation can have. The program fell short on clear strategies and program design, which explains in part the results of this paper and constitutes important feedback for policy implementers.

The remainder of the paper is organized as follows. Section 2 summarizes the main results from the literature, while Section 3 describes the context, goals, and implementation of the ELP. Sections 4 and 5 describe the data and identification strategies we use in this evaluation. We present our main results in Section 6 and explore the possible channels that could explain these results in Section 7. Finally, we present our conclusions in Section 8.

2. Previous studies

To induce higher enrollment rates and increase the education quality across the public education system, several countries are currently implementing multilevel interventions that aim at improving various schooling inputs. Even though multilevel interventions are not homogenous across countries, they share three common features: (1) most programs focus on low-performing schools; (2) all programs combine at least two interventions at the school and teacher level, and; (3) most programs include the provision of materials and teacher training in combination with infrastructure rehabilitation or leadership training. It is important to underscore that there are other types of interventions at the school level that have more than one component, but that are not necessarily multilevel interventions as they are only targeted to one organizational level. For instance, school management interventions such as the School Management Program in Brazil (Tavares, 2015) include training to school managers (principals and coordinators) and development of monitoring indicators and action plans, but do not include a teacher-level component.

The most recent review conducted by Snilstveit et al. (2015) shows 10 studies reporting causal evidence of multilevel interventions in low and middle-income countries. The authors conduct a meta-analysis showing that multilevel interventions have, on average, improved standardized math test scores by 0.16 standard deviations and language test scores by 0.04 standard deviations. However, they also report large heterogeneity in effect sizes, ranging from a negative impact for third grade students in China and for urban students in Mexico, to modest positive effects for primary students in Chile and large positive effects for fifth grade students in China (Snilstveit et al., 2015).

Among the 10 studies that examine the effect of multilevel interventions on educational outcomes, five programs share at least three common characteristics with the ELP: the combination of materials, teacher training, and management training at the school level. Also, one program has in common the combination of materials and teacher training, but the management piece corresponds to governance at the subnational level ("Rural Education Project" in Colombia). The evidence for the impacts of these programs on language test scores is mixed, with positive effects in the case of Chile (Bellei, 2011; Chay et al., 2005), Colombia (Rodríguez, Sánchez, & Armenta, 2010), Uruguay (Cerdan-Infantes & Vermeersch, 2007), and rural Mexico (Paqueo & Lopez-Acevedo, 2003); no effects in the case of Jamaica (Lockheed, Harris, & Jayasundera, 2010); and negative effects in the case of Mexico for urban students (Paqueo & Lopez-Acevedo, 2003).

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