TC ABSTRACT
EC-T1322
Closing Gaps: the impact of teaching quality in early schooling

I. Basic project data

▪ Country/Region:	Ecuador
▪ TC Name:	
▪ TC Number:	EC-T1322
▪ Team Leader/Members:	Yyannú Cruz Aguayo (TL, SCL/SCL); Norbert Schady (CO-TL, SCL/SCL); Julien Hautier (EDU/CEC); Jorge Luis Castañeda, María Adelaida Martínez, Sara Ciner Schodt , Raquel Trigo (SCL/SCL); and Mónica Lugo (LEG/SGO).
▪ Indicate if: Operational Support, Client Support, or Research & Dissemination.	Client Support
▪ If Operational Support TC, give number and name of Operation Supported by the TC:	
▪ Reference to Request[1]: (IDB docs #)	39505979
▪ Date of TC Abstract:	March 19, 2015
▪ Beneficiary (countries or entities which are the recipient of the technical assistance):	Ecuador
▪ Executing Agency and contact name (Organization or entity responsible for executing the TC Program) {If Bank: Contracting entity} {If the same as Beneficiary, please indicate}	Bank-executed (contact name: Yyannú Cruz Aguayo)
▪ IDB Funding Requested:	US$2,000,000.00
▪ Local counterpart funding, if any:	
▪ Disbursement period (which includes execution period):	30 months
▪ Required start date:	04/16/2015
▪ Types of consultants (firm or individual consultants):	Firm and individual consultants
▪ Prepared by Unit:	SCL/SCL
▪ Unit of Disbursement Responsibility:	SCL/SCL
▪ Included in Country Strategy (y/n); ▪ TC included in CPD (y/n):	No No
▪ GCI-9 Sector Priority:	Social Policy for Equity and Productivity

II. Objective and Justification

2.1 This Technical Cooperation (TC) is motivated by two salient features of educational outcomes in Latin America and the Caribbean (LAC). First, in Latin America, marked

[1] A copy of the Letter of Request, Programming/Portfolio Review Mission Aide Memoire or Report requesting the TC should be submitted with the Abstract.

differences in cognitive development between children from poor and less poor households emerge early in life (Paxson and Schady 2007; Schady et al. 2013). And secondly, students from the region perform dismally on international tests of academic achievement as compared to students from other countries with similar income levels: less than five percent of children in Latin America even reach the score of the average student from the East Asian countries on the PISA international tests (Levy and Schady 2013).

2.2 A key factor that might explain the low performance of Latin American students on international tests is the poor quality of teaching, which is widely recognized as a policy priority for the educational sector in the region. Besides home environment, teachers are the most important factor affecting student learning. However, it is well known that observable characteristics of teachers (degrees, qualifications, and years of experience) explain remarkably little about student learning outcomes in both developed and developing countries. The effort to identify the determinants of high quality teaching and the ways to improve it has led in recent years to a great deal of research and policy experimentation. Numerous studies have attempted to measure teaching quality; nevertheless, there is still no consensus on how to best measure effective teaching or to improve current teachers' practice (see the Measures of Effective Teaching Project for a reference in the US). That said, there is a growing consensus around the fact that only interventions that actually change teachers' day-to-day classroom practices in such a way as to also change students´ daily experiences within the classroom will have any success at improving learning outcomes.

2.3 This TC has two main general objectives: i) to identify which characteristics and practices of teachers allow young, disadvantaged children, who enter school already with profound deficits in cognitive development, to close their skills gaps and catch up to their peers; and ii) to set up a mentoring pilot for in-service teachers that aims at directly improving their pedagogical practices. Therefore, the TC is aligned with the Bank's GCI-9 priority of "Social Policy for Equity and Productivity", in the strategic area of "raising the quality and equity of education." Additionally, this TC contributes to the Bank´s GCI-9 goal of programs for "small and vulnerable countries." The goal of this TC is also strongly linked to specific goals mentioned in the Country Strategy for Ecuador 2012-2017, which identifies Social Development as one of the main areas for Bank Intervention.

2.4 The specific objective of this TC is to continue a longitudinal project, "Closing Gaps", which evaluates different dimensions of teacher quality. The project has very important policy implications for Ecuador and other countries in the region, by providing rigorous evidence for the design of effective teacher selection and evaluation systems, targeted in-service teacher training programs, and for compensatory educational programs for disadvantaged children, among others. For this reason, and taking into account the feedback received from leading international experts in the field, the Ministry of Education in Ecuador (MinEduc) and IADB teams have decided to make "Closing Gaps" a multi-year project that will follow the original cohort of students and their different teachers as they advance through primary school.

2.5 Every year since the 2012-2013 school year, through an agreement with and supported by the MinEduc, a cohort of approximately 16,000 children entering kindergarten in 204 schools in April of 2012 have been randomly assigned[2] at the beginning of the school year to their classrooms and teachers. Each school has at least two class sections per grade, making it possible to compare students taught by different teachers within the same school. The total number of classrooms followed as part of the study has been approximately 451 each year, with some schools having up to six class sections of the same grade. An easy-to-monitor and verifiable rule of classroom assignment is set in order to ensure the randomization process. On the basis of four follow-up visits, it has been possible to confirm a more than 95% compliance rate for random assignment each year.

2.6 At the beginning of the 2012-2013 academic year, an assessment of each child's baseline level of development was performed. Each year every classroom has also been filmed during an entire school day, and the resulting videos have been coded following a protocol that measures "responsive teaching", that is, the quality of the interactions of teachers with their students. Subsequently, at the end of each school year, a set of tests is applied to all children attending any school in the sample, and also for those that have dropped out (these children are tested in their homes). The tests are intended to assess early literacy and math skills, as well as executive function.[3] Additionally, for the first year of the study (2012-2013) household surveys for each child were also collected with the support of the Ministry of Social Development (MCDS). The information obtained included, among other things, socioeconomic data on the environment in which children lived, and on the stimulation that they received at home. Simultaneously, an additional 100 schools were visited in order to obtain a representative sample at the regional level and to begin to structure a national benchmark for the 204 schools of the study. Children from these schools were also tested, filmed, and visited at their homes.

2.7 The study has also been subject to wide dissemination at different levels. Meetings have been carried out regularly with the Minister of Education of Ecuador and his team, both in Quito and at the IADB headquarters in Washington, D.C. The MinEduc, with support from the IADB team, has conducted several workshops with the principals and teachers from the participating schools. In 2013, the Bank hosted a workshop with leading experts on teaching quality, which, in addition to multiple presentations in 2014 at international conferences and academic seminars, have given the project unique exposure to high quality feedback.

2.8 A few policy-relevant results from the study include: (a) there are substantial impacts of teachers on learning outcomes (math, language an executive function); (b) teacher characteristics, on which much of the selection, evaluation and compensation systems are currently based, do not explain much of teachers' performance; (c) other, not commonly measured, characteristics (including IQ, personality traits) are also not good predictors of

[2] By randomly assigning students to their sections and teachers, and enforcing this assignment, this project overcomes a fundamental hurdle that has plagued the literature on the impacts of teachers on learning outcomes, "teacher effects", making this project unique. When students are not assigned to teachers at random, the calculated effects might be biased: If better teachers have more bargaining capacity than worse teachers, they may be assigned easier students: Estimated teacher effects will generally be biased up. If school administrators have preferences for equalizing learning outcomes, they may assign more difficult students to better teachers: Estimated teacher effects will generally be biased down.

[3] Executive function ("EF") includes a set of basic self-regulatory skills which involve various parts of the brain, but in particular the prefrontal cortex. EF is an important determinant of how well young children adapt to and learn in school.

teacher effectiveness; (d) on the other hand, teachers' classroom behaviors and practices are strongly associated with better learning outcomes; (e) all children benefit from a good teacher, there is no distinction between girls and boys, or socioeconomic status, for example; and finally, (f) an effective teacher one year seems to be effective in the next year (on the same subjects and across subjects).

2.9 It is critical that the study is extended one more year for at least four reasons: **(i)** it is important to establish whether any short-term teacher effects on children's learning and development observed after each year of schooling are maintained over time. That is, whether children assigned to a more effective teacher in kindergarten/first grade/second grade have better outcomes after one/two/three years, and do these gains persist at the end of first grade/second/third grade? Are the teacher effects amplified over time? Or, conversely, are the gains fleeting and fade out?; **(ii)** On a similar note, it is important to establish how having a better teacher in one grade interacts with having an effective teacher in the following grade. Is the effect additive—that is, is the effect of having two good teachers in a row double the effect of having a good teacher in a single grade? Or, rather, is there complementarity in teacher quality, so that a good teacher in one grade can build on the effects of an effective teacher in the previous grade. And how do these effects vary for children who started school with bigger or smaller delays, for girls and boys, and for children from different ethnic backgrounds?;[4] **(iii)** To establish whether "teacher effects", that is, the impacts of teachers, are stable from one year to another: does teaching quality vary from year to year? Is a "good" teacher "good" in different school years? Is a teacher "good" with different groups of students?; **(iv)** Finally, it is imperative that the important findings of this study are translated into actual policy, and for that purpose a series of carefully-designed and rigorously evaluated pilots of interventions should be developed.

2.10 This TC will fund the extension of the work for an additional year to address each of the reasons stated in the previous paragraph. In order to do so, for the 2014-2015 school year (the fourth year of the study), there will be three main component initiatives corresponding to the reasons listed above: **(a)** follow the original cohort of children with their new teachers (students will be randomized to their third-grade classrooms and teachers)- reasons (i) and (ii); **(b)** test students of teachers that have already participated in the project in previous years – reasons (i), (ii) and (iii); **(c)** engage a new group of teachers that will participate in a mentoring program pilot designed to make teaching practices more effective (focusing on teacher-students interactions).

III. Description of activities and outputs

3.1 **Component 1: Randomization, verification and measurement of learning outcomes – original cohort of students**. At the beginning of the school year 2015-2016 (May 2015), the original group of children will be randomly assigned to their new teachers as they begin third grade (Activity 1). In order to verify the compliance of the random assignment, each school will be visited at different points in time during the school year (Activity 2). A set of tests (math, language and executive function) to measure learning/development outcomes for children in the sample will be developed/reviewed/piloted (Activity 3). These tests will

[4] Potential peer effects will also be taken into consideration. A potential instrument to measure those peer effects might be developed using the videos obtained from each classroom. In addition, a brief questionnaire on students´ behaviors and academic achievement was applied at the end of the previous school year; this, in combination with the rest of the data available, will also be used to shed some light on potential peer effects.

then be applied at the end of the school year (Activity 4). All data collection is expected to be completed by February 2016.

3.2 **Component 2: Measurement of child development and learning – original teachers**. To obtain evidence of the effectiveness of teaching over time and with different groups of students (in order to then develop teacher policies that are sustainable and effective in the medium and long term), the original teachers from the study – that is, those who taught kindergarten, first grade and second grade to the original cohort of students - will be reincorporated to the project. Each of these teachers will have a new group of students, whose learning outcomes will be measured at the beginning and at the end of the school year 2015-2016. A baseline of cognitive development will be obtained for these new cohorts of students (Activity 1). Additionally, as part of this component, a set of tests (math, language and executive function) to measure learning/development outcomes for children in the sample will be applied at the end of the school year (Activity 2). All data collection is expected to be completed by February 2016.

3.3 **Component 3: Set up of pilot of a mentoring program for in-service teachers.** Most of the current professional development (PD) programs for teachers in the LAC region are based on series of theoretical lessons/workshops, with little to no focus on specific classroom practices/behaviors.[5] Given one of the main findings of the first years of the project, that the quality of the interactions between teacher and students predict learning outcomes, along with evidence (mostly in the US) that it is possible to train teachers to improve their interactions with students (Allen et al. 2011; Pianta et al. 2008), we are proposing the first pilot of a potential intervention based on the evidence produced by the project. This component will cover activities to set up a pilot and impact evaluation of a mentoring program for in-service teachers. The component will finance a number of activities that are critical to start the pilot and its evaluation, specifically: i) Development of the contents of the intervention (mentoring program) (Activity 1); ii) application of instrument (questionnaire and classroom observation) to identify potential mentors and mentees (Activity 2); iii) initiation of mentoring sessions (Activity 3). The first mentoring session is planned for September 2015.

IV. Budget

Indicative Budget

Component/Activity	Description	IDB Funding	Counterpart Funding	Total Funding
Component 1. Original Cohort of Children				
Component 1/Activity 1	Randomization	$75,000		$75,000
Component 1/Activity 2	Verification of randomization	$45,000		$45,000
Component 1/Activity 3	Pilot of end-of-school-year tests	$30,000		$30,000
Component 1/Activity 4	Field work end-of-school-year tests	$630,000		$630,000
Component 2. Original Teachers with New Students				
Component 2/Activity 1	Baseline of cognitive development	$230,000		$230,000
Component 2/Activity 2	Field work end-of-school-year tests	$800,000		$800,000
Component 3. Set up - Mentoring Program Pilot				
Component 3/ Activity 1	Development of content and materials	$50,000		$50,000

[5] Murnane and Ganimian (2014) point out to what might be obvious, but which is not reflected in the PD programs in the region: low-skilled teachers need specific guidance to reach minimally acceptable levels of instruction.

Component 3/ Activity 2	Identification of mentors and mentees	$100,000		$100,000
Component 3/ Activity 3	First mentoring session	$40,000		$40,000
			Total	$2,000,000

V. Executing agency and execution structure

5.1 This TC will be Bank executed. In agreement with the MinEduc, the Bank has executed all the TCs that funded the first three years of this project.

5.2 The Bank will procure the goods, services and consulting services required by the Project in accordance with Bank policies contained in documents GN -2349-9 and GN-2350-9, respectively.

VI. Project Risks and issues

6.1 Implementation risks are considered low for the first two components and low/medium for the third component. We identified two risks. First, there is a risk that the fieldwork may encounter delays to its completion. In this particular study, there is limited space for delays given that the data collection activities must finish by the end of the school year. To mitigate this risk the schedule of activities is being designed to take into account any possible delays, adjusting the times of each data collection effort. Secondly, there is a risk that a few school principals/teachers/parents might not comply with the planned activities including the random assignment, testing of students and mentoring sessions. In those cases, the Ministry of Education has committed to mediate and correct any deviations from the plan. The differentiated risk levels between component 1 and 2 and component 3 respond to the fact that all the activities considered within component 3 are relatively new for both MinEduc and Bank teams.

VII. Environmental and Social Classification

7.1 The ESG classification for this TC is “C”. Ver salvaguardias en: http://idbdocs.iadb.org/wsdocs/getDocument.aspx?Docnum=39505818