

TC Document

I. Basic information for TC

• Country/Region:	Ecuador - Andean Group
• TC Name:	Closing Gaps VI and VII: teaching and learning throughout primary school
• TC Number:	EC-T1372
• Team Leader/Members:	Yyannú Cruz Aguayo (team leader); Norbert Schady (co-team leader); Sara Schodt, Vania Pizano (SCL/SCL); and Mónica Lugo (LEG/SGO)
• Taxonomy:	Client Support
• Date of TC Abstract:	21 Feb 2017
• Beneficiary:	Ecuador
• Executing Agency:	Inter-American Development Bank through the Social Sector (SCL/SCL)
• Donors providing funding:	OC-SDP for Social Development
• IDB Funding Requested:	\$2,500,000.00
• Local counterpart funding, if any:	\$0.00
• Disbursement period:	36 months
• Required start date:	Abril 2017
• Types of consultants:	Firms and individual consultants
• Prepared by Unit:	SCL/SCL
• Unit of Disbursement Responsibility:	SCL/SCL
• Included in Country Strategy:	Yes
• TC included in CPD:	No
• Strategic Alignment:	Social inclusion and equality

II. Objectives and Justification of the TC

- 2.1 **Background.** While Latin America and the Caribbean has made impressive gains towards universal coverage for preprimary and primary school children, achievement (learning) is now at the forefront of the education agenda, as students from the region seem to learn little, routinely performing dismally on international tests compared to other countries with similar income levels. According to the latest results from PISA (2015), on average, 63% of the LAC students did not achieve basic proficiency in math, and 46% did not achieve this level in reading. Teachers might be a key factor when explaining these results, as they are the most important determinant of child development and learning within schools.
- 2.2 Collecting accurate evidence of the impacts of teachers on learning is not an easy task, due to several important methodological constraints. First and foremost is the fact that students are not assigned to teachers/classrooms randomly; rather, these assignments are mostly done purposely, based on beliefs and preferences held by headmasters, teachers and parents, and resulting inertia. These decisions can result in biased estimates of the impact of teaching on learning.
- 2.3 While the vast majority of rigorous studies on teaching quality have focused on developed countries, the issue of how students learn and the impact of teachers on learning is also a pressing one in the developing world, where learning outcomes are frequently dismal. In settings such as these, establishing how much teachers vary in the effects they have on learning, and why this is so, are critical policy questions.
- 2.4 In a world where rigorous evidence should drive effective and innovative education policies and programs, the Closing Gaps project in Ecuador¹ is an example for both the

¹ See: [Activities report](#) and the TC documents: ATN/OC-13003-EC; ATN/JF-133365-EC; ATN/OC-13782-EC; ATN/OC-14124-EC; ATN/OC-14450-EC; ATN/OC-15266-EC; ATN/OC-15468-EC; and ATN/OC-15690-EC.

region and the world of how high quality data might better inform policy and practice. Since its beginning in 2012, Closing Gaps has generated unparalleled evidence about how children best learn and what makes for effective teaching in kindergarten through 4th grade. **No study of teacher effects in a developing country is comparable in its ambition, in the rigorous design of its identification strategy, or in its execution.**²

- 2.5 In Closing Gaps, two cohorts of children entering kindergarten (in 2012 and 2013, respectively), totaling more than 24,000 students, were randomly assigned to different classrooms within approximately 200 schools. Children in the 2012 cohort were then randomly reassigned to classrooms in 1st, 2nd, 3rd, and 4th grade. In every grade, compliance with the assignment rule has been almost perfect, and attrition minimal. At the end of each grade, very rich data has been collected on students: children have been tested in math, language, and “executive function” (EF), which measures a child’s ability to regulate her thoughts, actions, and emotions, all of which are central to the learning process (Anderson 2002; Espy 2004; Senn et al. 2004), and are well-rewarded in the labor market thereafter (Heckman and Kautz 2012). Closing Gaps has also collected very rich data on teachers, including standard information on years of experience, education, and contract status; the project also measured teacher IQ,³ personality,⁴ attention and inhibitory control,⁵ and parental education. Furthermore, in 2016 teachers were evaluated on their ability to identify effective classroom practices using a measure adapted from the validated VAIL instrument with the help of researchers at the University of Virginia. Finally, teachers were filmed teaching a class for an entire school day. These videos are coded to measure the quality of the interaction of teachers and students, using a protocol known as the Classroom Assessment Scoring System (CLASS, Pianta et al. 2007). The CLASS is a measure of a series of teacher behaviors that can collectively be described as “Responsive Teaching” (Hamre et al. 2014). The CLASS was also collected for 1st, 2nd, 3rd and 4th grade teachers. Finally, at the end of kindergarten, household data were collected for study children, including a parental assessment of teacher quality, household investment in child development and learning (such as the availability of books, and toys), and parental behaviors (such as whether parents read to or played with their children).
- 2.6 **Objectives.** This TC will support the final next two stages of Closing Gaps (5th and 6th grades), which main objective is to better understand the learning process during elementary school, and to identify which of those characteristics and practices of teachers in the classroom are most successful in closing the learning gap between the poorest children and their better-off classmates. These effects can only be observed throughout

² The two studies that are most closely related to *Closing Gaps* are Project STAR in Tennessee (Krueger 1999; Nye et al. 2004; Chetty et al. 2011, among a large number of papers), and the MET project, financed by the Gates foundation (Kane and Staiger 2012), both in the United States. *Closing Gaps* compares favorably to both studies in its design and implementation. In STAR, 11,600 Tennessee kindergarten students and teachers were randomly assigned to one of three types of classes in the 1985-86 school year: small classes (13-17 students), regular-size classes (22-25 students), and regular-size classes with a teacher’s aide. These children have since been followed over time into young adulthood. However, in STAR no data were collected on children’s test scores at baseline, and no data are available on teaching practices. In the case of MET, contamination of the experiment was a serious issue: Across the six different sites, compliance with the random assignment ranged from 66 percent (in Dallas) to 27 percent (in Memphis). Also, the sample of teachers in MET is drawn from those who *volunteered* to be in the study, which may limit external validity. Finally, there was substantial attrition: about 40 percent of the 4th through 8th grade sample in MET, and more than half of the high school sample, were lost to follow-up in a single year.

³ To measure teacher IQ, *Closing Gaps* used the Spanish-speaking version of the Wechsler Adult Intelligence Scale (WAIS-III; the Spanish-speaking acronym is EIWA-III; see Wechsler 1939, and subsequent updates). The WAIS is the most widely-used test of IQ.

⁴ To measure teacher personality, the *Closing Gaps* study used the Big Five, the most widely-accepted taxonomy of personality traits (Costa and McCrae 1992; Goldsmith et al. 1987). It focuses on five traits: neuroticism, extraversion, openness, agreeableness, and conscientiousness.

⁵ To measure attention and inhibitory control, *Closing Gaps* applied a test in which subjects are quickly shown sets of incongruent stimuli (for example, the word “red” printed in blue ink) and are asked to inhibit a habitual or automated response (in this case, they would be asked to name the color of the ink rather than read the word) (Jensen and Rowher 1966; MacLeod 1991; Stroop 1935)

time, and are the ones that provide the most meaningful evidence to inform policy. Simply put, to create highly effective policies and programs to improve elementary school teaching and learning, we must have data on these processes from the later years as well.

2.7 Main findings and Policy Implications. To date, Closing Gaps has already made an impressive contribution to the field of early learning, collecting the highest quality data to date to support a number of findings about the accumulation of human capital at early ages, including the following: (i) The impact of teachers on student learning is substantial: an outstanding (as compared to average) teacher moves the average child from the 50th percentile to the 58th percentile of the distribution of learning in a single grade. (ii) However, the impact of having a better teacher fades out over time if children go on to have less effective teachers. (iii) Having a better teacher in one year interacts in important ways with having a better teacher in the next year, and the effect of having an outstanding teacher three years in a row is roughly twice the magnitude of the sum of the individual effects for kindergarten, 1st grade, and 2nd grade⁶. (iv) The quality of the interactions that teachers have with children in three domains—classroom management, socio-emotional support, and instructional support—predict the amount of learning that takes place in a classroom. (v) Important and significant gaps in learning outcomes exist between children of high and low socioeconomic status. These learning gaps are already apparent in kindergarten, and the first years of formal schooling do little to close them. More than half of the gap between richer and poorer children occurs within the same schools. (vi) In math, there are substantial differences in the test scores of boys and girls, and these increase as children progress through the school system. For every two girls at or above the 95th percentile, there are on average three to four boys. (vii) Having a child with a serious behavioral difficulty in the classroom has an effect that is opposite and roughly half the magnitude as having an outstanding, rather than an average, teacher. Almost all the children with the most serious behavioral problems are boys and are relatively few in number—about one percent of all children in the sample—but because class size is large (about 35 children per class on average), children with serious behavioral difficulties have substantial negative effects on the learning of their classmates.

2.8 The findings to date have important policy implications, which include:

- a) There could be large returns to policies that seek to identify and recruit better teachers, provide innovative forms of in-service training or mentoring, or reward teachers that are consistently effective in producing more learning. The data generated to date from Closing Gaps has already informed the development of an evidence-based teacher professional program that the Bank will pilot this coming year.
- b) When a child is exposed to a string of good teachers in a row, the “fade-out” of teacher impacts is much smaller than is the case when a child is exposed to a single good teacher. This argues for system-wide efforts to improve teacher quality. Alternatively, if there are only enough resources (or capacity) to improve the effectiveness of a smaller number of teachers, it would make sense to target policies to improve teacher quality in such a way that the most disadvantaged children are exposed to multiple good teachers.
- c) The fact that teacher-child interactions appear to be more strongly associated with child learning in the earliest years of elementary school suggests that policies that focus on improving interactions (for example, through mentoring and in-service training) will have larger effects when targeted at teachers in the lowest grades. This also means that it is necessary to better understand what aspects of teacher quality (other than interactions),

⁶ What Nobel Prize-winning economist James Heckman has called “dynamic complementarities” in the accumulation of early human capital.

- including for example the extent to which teaching is directed or inquiry-based, explain why some teachers of 3rd and 4th grade students are more effective than others.
- d) The large differences in the learning outcomes between children of high and low socioeconomic status in the same school is a strong argument for remedial policies that focus on poor children, or low-performing children. Individualized tutoring may be an option. Another option would be policies in which students are assessed regularly over the course of the school year, with the aim of having teachers focus on those specific skills and children who are lagging.
 - e) The substantial gap in the math performance of boys and girls is a challenge. Early math achievement is strongly associated with later math achievement and, eventually, with outcomes such as university attendance and even national productivity. Little is known to date about the causes of the boy-girl gap in Latin America and, therefore, about policies that can address it.
 - f) A small number of children seriously disrupt classroom learning. Teacher training on how best to manage disruptive children may have some positive effects, but coordination with the health and social welfare systems is critical.
- 2.9 **Justification.** For Closing Gaps to inform effective and impactful policies applicable to the whole elementary school learning cycle, it is imperative that we continue following students in the project as they finish elementary school, in order to understand how the causal relationships established between teaching and learning in the early grades play out in the final grades. While we have found evidence that the quality of teacher-student interactions is very significant in the early grades to produce learning, other teacher characteristics and practices, like the teacher's ability to individualize instruction for children of differing needs, might have more relevance in later grades.
- 2.10 Additionally, understanding the cumulative impact over time of different teachers on individual children could drastically improve our current policies. An effective sequence of teachers for a diverse group of children might imply different combinations of teachers with certain characteristics and practices in some grades, and other characteristics and practices in higher grades. The last two years of Closing Gaps will increase the breadth and depth of data on effective teaching and conditions for learning, and expand its applicability to the entire elementary school cycle, making the findings far more comprehensive, relevant and practically useful to policy makers and practitioners everywhere.
- 2.11 The implementation of such a unique and highly complex project in Ecuador involves a very close coordination of activities between the Ministry of Education (MinEduc) and the Bank. Every step of the process is carefully designed, reviewed, and supervised by both institutions. Along these years there has been significant knowledge sharing between the Bank and MinEduc.⁷ While the Bank has devoted important financial resources and its technical expertise and experience for the project, MinEduc contributes with the necessary in-kind resources to enforce each step of the process and the contribution of both is essential. All technical and progress updates about the execution of the Project are produced jointly.
- 2.12 The project has significant and direct policy implications for Ecuador and other countries in the region, some of which are already being used in concrete initiatives⁸. Additionally, the project has been subject to wide feedback, constructive criticism, and dissemination at different levels. The first academic paper reporting results from the project was

⁷ A concrete example of the benefits of knowledge sharing are the workshops that the Ministry of Education has organized where the Bank has been invited to jointly present the preliminary results of the study.

⁸ Including components in an approved loan (EC-L1155) and a pilot mentoring program for in-service teachers in Ecuador (EC- T1351)

published in a top peer reviewed journal in 2016.⁹ Meetings have been carried out regularly with the Minister of Education of Ecuador and his team, including a regional policy dialogue in 2016. The Bank team has also provided policy advice on specific topics around teacher quality to the governments of Uruguay, Peru, Colombia, Mexico, Jamaica and Trinidad and Tobago. Results from the project have been presented in several workshops and conferences, and cited in external and internal academic and policy oriented publications.

- 2.13 This TC is consistent with the Update to the Institutional Strategy (UIS) 2010-2020 (AB-3008) and is aligned with the development challenge of “social inclusion and equality”, as education is a catalyst to break the inter-generational poverty cycle and it helps to foster social mobility. This TC is also consistent with the Education and Early Childhood Development Sector Framework Document (GN-2708-5), especially in its third dimension –ensuring that all students have access to effective teachers. And its activities are embedded in the social development sector, considered as a priority in the IDB Country Strategy with Ecuador 2012-2017.¹⁰
- 2.14 The returns of the investment of Ministry of Education in Ecuador, and the Bank on the project are substantial when considering the policy dialogue and policy changes currently being developed in the region, directly based on the project’s results (or informed by them), at a crucial point in time in which an important number of countries in Latin America and the Caribbean are in the active process of restructuring their teacher policies. The project has also helped to solidify the Bank’s position as a leader in the production of evidence in the teaching quality field.

III. Description of activities/components and budget

- 3.1 **Component 1: Randomization, verification and measurement of learning outcomes.** At the beginning of the 2017-18 and 2018-19 school years, the original cohort of children will be randomly assigned to their new teachers as they begin fifth and sixth grade, respectively. In order to verify the compliance of the assignment, each school will be visited at different points in time during the school year. In order to do this all the schools in the sample will be contacted by phone and in person by enumerators from the firm that is managing the data collection (Activity 1). Later in the school year, a set of tests to measure learning/development outcomes in language and executive function¹¹ for children in the sample will be developed in collaboration with the MinEduc. These tests will then be piloted in the field on another group of children in the Sierra region to determine which specific tests are the most suitable for fifth and sixth graders. Based on the results of the pilot, the tests will be recalibrated and modified as needed (Activity2). The tests will then be applied at the end of each school year (Activity 3).
- 3.2 **Component 2: Filming, training, and analysis of classroom quality data.** In order to obtain a valid and reliable measure of the quality of teaching in the classrooms participating in the study, the project will utilize the CLASS classroom observation protocol. Classroom videos will be systematically edited and then coded over a series of months following the standardized CLASS analysis protocol to assign a numeric value to the overall level of quality process taking place in the classroom that evidence shows to have the greatest impact on child learning (Activity 1).

⁹ Maria Caridad Araujo, Pedro Carneiro, Yyannu Cruz-Aguayo, and Norbert Schady. 2016. Teacher Quality and Learning Outcomes in Kindergarten”. 2016. Quarterly Journal of Economics, Volume 131, Issue 3: 1415-1453.

¹⁰ The TC objectives are also aligned with the OC-SPD for Social Development objectives of “Enhance relevance, quality, and volume of IDB lending in support of social sector priorities” and “strengthen public institutions efforts to become more effective an efficient in social programming, group targeting, and project execution”.

¹¹ In all previous years math tests have also been collected. Additional resources will be sought to collect math outcomes.

- 3.3 **Component 3. Analysis and dissemination.** This component will cover costs related to data analysis as well as the cost of dissemination activities. The reports, working papers, presentations, etc., will be of free access, and will be disseminated through internal and external channels. The target audience to disseminate the results comprises policymakers, education policy experts in the region, leading agencies that promote teaching quality, researchers in the field, among others.
- 3.4 The total amount requested for this TC is US\$2,500,000, and it will be financed by the OC-SDP for Social Development. MinEduc through its central and regional offices will provide in-kind contributions, these include: (i) official communications/workshops with the principals/teachers/school administrators in the study; (ii) the logistic and supervision activities necessary for fieldwork; (iii) review of each of the proposed tests against the current curricula; and (iv) participation in the preparation of reports to stakeholders. All resources of the TC will finance consultancy services (individuals and firms) to carry out the activities described above in each component. Data collection activities and the corresponding analysis absorb most of the resources.

Indicative Budget (US\$)				
Activity/ Component	Description	IDB/Fund Funding	Counterpart Funding	Total Funding
Component 1. Verification and measurement of learning outcomes – original students				
Activity 1	Randomization and Verification	275,000	0	275,000
Activity 2	Development and pilot of end-of-school-year tests	140,000	0	140,000
Activity 3	Fieldwork end-of-school-year tests	1,500,000	0	1,500,000
Component 2. Filming, training, and analysis of classroom quality data				
Activity 1	Filming, training, and analysis of classroom quality data	560,000	0	560,000
Component 3. Analysis and dissemination				
Activity 1	Analysis	15,000	0	15,000
Activity 2	Dissemination	10,000	0	10,000
Total				2,500,000

IV. Executing agency and execution structure

- 4.1 As requested by the beneficiary, this TC will be Bank executed through the Social Sector Department (SCL/SCL). The request is based on the need to ensure continuity with the first five years of the project, in which the Bank executed the TCs.¹² The Bank has also been developing various activities related to a longitudinal study on child development, among other studies, and therefore it has a competitive advantage to continue with the execution of the TC. As such, there will be a significant benefit in terms of knowledge sharing and capacity building for the counterparts if the Bank executes the project.
- 4.2 The project will collect information primarily during the school years 2017–2018 and 2018-2019. However, there is also information that needs to be collected at the beginning of the following school year, this is the case for example of administrative information and teacher surveys. To allow time for the execution of these activities, the TC will disburse in 36 months and execute in 30 months.

¹² ATN/OC-13003-EC 100% disbursed; ATN/OC-13782-EC 100% disbursed; ATN/OC-14124-EC 100% disbursed; ATN/OC-14450-EC 100% disbursed; ATN/OC-15468-EC 100% committed and 97.6% disbursed; ATN/OC-15266-EC 100% committed and 87.37% disbursed; ATN/OC-15690-EC 100% committed and 26.20%. Each of these TCs has produced at least two datasets (intermediate products), that are currently being used in the production of academic papers and policy notes (final products). Technical cooperation resources approved for this project from 2011 up to date amount \$9,096,909.00.

- 4.3 The Bank will contract individual consultants, consulting firms and non-consulting services in accordance with the Bank's procurement policies and procedures. The Bank will procure the consulting services according to the applicable Bank's policies and procedures. For Component 1 and 2, single source procurement is recommended, to be executed by the service provider "Habitus MillwardBrown S. A." (Habitus) for data collection, this in accordance with paragraph 2.7 and 2.9 of the Operational Guidelines for the Selection and Contracting of Consulting Firms in Bank-executed operational work. The justification for single source is based on the necessity of a firm with a proven record of expertise in technical fieldwork logistics and on collecting this type of information in several specific key areas of the country. Habitus was contracted by PRC (Corporate Procurement) initially for this project and has been granted approval by the Corporate Procurement Committee (PRC) of the Bank of a major amendment adding additional scope of services to the existing contract.¹³ Habitus has acquired unique experience in performing surveys and cognitive tests, providing accurate data and coded videos for this project, following very strict and specific research protocols. Furthermore, Habitus has been working for the past five years in close coordination with MinEduc, so it has an unparalleled experience to work with the Ministry and school authorities for this project. Also, the institutional knowledge about the schools and students in the study is necessary for an appropriate follow-up at this stage. Hence, Habitus provides unique services and is the best candidate to continue carrying out the necessary additional tasks for the project.

V. Major issues

- 5.1 Specific implementation risks are considered low/medium for both components. We identified common risks. First, the fieldwork may encounter delays to its completion. As in previous years, the MinEduc and the IDB are working together to help anticipate unknowns, and the schedule of activities already takes into account possible delays. Another possible risk is that a few school principals/teachers/parents might not comply with the planned activities, including the random assignment, testing of students and filming. In those cases, the MinEduc has committed to mediate and correct any deviations from the plan. In the four years of the implementation of the project there has never been an extreme case where a stakeholder refuses to participate. It is also possible that there will be some changes in leadership of key officials at MinEduc. Nevertheless, given that this project is considered highly relevant by MinEduc, current officials are establishing the necessary agreements so that the study continues as planned.¹⁴ Finally, there are significant considerations about the sustainability of the project given the amount of resources needed each year. To respond to this risk, the team and partners are in the process of identifying complementary funding sources to the Social Fund, such as grants and donations.

VI. Exceptions to Bank policy

- 6.1 None

VII. Environmental and Social Strategy

- 7.1 The ESG classification for this TC is "C" according to the Environment and Safeguards Compliance Policy (OP-703). There are no potential negative environmental and/or social impacts associated to this TC anticipated ([See filters](#)).

Required Annexes:

- [Annex I - Government request](#)
- [Annex II - Results Matrix](#)
- [Annex III - Terms of Reference](#)
- [Annex IV - Procurement Plan](#)

¹³ See IDB Docs document <http://www.iadb.org/projectDocument.cfm?id=40414595>

¹⁴ This includes signing a general memorandum of understanding with the Bank, and protocols that refer specifically to data collection, and its use/property.