**TC ABSTRACT**

## I. BASIC PROJECT DATA

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|---|---|
| ▪ Country/Region: | Regional |
| ▪ TC Name: | Improving Education through Broadband: Best Practices for Policy Design II |
| ▪ TC Number: | RG-T2634 |
| ▪ Team Leader/Members: | Elena Arias (SCL/EDU), Team Leader; Julian Cristia (RES/RES) Alternate Team Leader, Livia Mueller (SCL/EDU) |
| ▪ Taxonomy | Research & Dissemination (RD) |
| ▪ If Operational Support TC, give number and name of Operation Supported by the TC: | N/A |
| ▪ Reference to Request: (IDB docs #) | In process |
| ▪ Date of TC Abstract: | 4/23/2015 |
| ▪ Beneficiary (countries or entities which are the recipient of the technical assistance): | Regional |
| ▪ Executing Agency and contact name (Organization or entity responsible for executing the TC Program) | Bank Executed (contact name: Elena Arias) |
| ▪ IDB Funding Requested: | US$300,000 |
| ▪ Local counterpart funding, if any: | US$0 |
| ▪ Disbursement period (which includes execution period): | 24 months |
| ▪ Required start date: | August 1st, 2015 |
| ▪ Types of consultants (firm or individual consultants): | Firms and individual consultants |
| ▪ Prepared by Unit: | SCL/EDU; RES/RES |
| ▪ Unit of Disbursement Responsibility: | SCL/EDU |
| ▪ Included in Country Strategy (y/n);<br>▪ TC included in CPD (y/n): | No<br>No |
| ▪ GCI-9 Sector Priority: | Social Policy for Equity and Productivity |

## II. OBJECTIVE AND JUSTIFICATION

2.1 Latin American countries fare poorly in international comparisons of learning assessments (Bos, Ganimian and Vegas, 2013). Weak performance on these tests has been clearly linked to poor economic performance (Hanushek and Woessman, 2009). Consequently, many countries in the region have been actively seeking for innovative solutions that can significantly improve student learning. Access to broadband Internet in the classroom, and the use of technology in general, is precisely one very promising path to achieve this by introducing new ways of learning and supporting collaborative learning in virtual environments. With broadband Internet, intranets and networks in schools, virtual teaching environments can be set up which could complement or even replace classroom work (Sunkel, Trucco and Espejo, 2013).

2.2 With this objective in mind, governments in the region have invested substantial resources to increase students' access to computers and broadband at school. However, emerging evidence suggests that the programs implement so far that merely provide access to these

resources has actually produced limited gains in terms of learning. Policy-makers lack clear models on how to use these technological resources effectively in education; in spite of that, a tendency exists to make renewed investments in this area. Hence, there could be large returns in identifying programs that can successfully leverage technology access for educational purposes.

2.3 As a first step to provide solid knowledge in the area of technology education to governments, the Bank approved the regional technical cooperation RG-T2337 with the support of the Broadband Program. The aim of this TC was to summarize the existing theoretical models and global empirical evidence to pinpoint the most promising technology in education programs and policies to increase learning in LAC. To achieve these results, two main activities were implemented. First, the Education Division and the Research department co-organized an event titled "Schools Ready for Change" on October 22, 2014 in Washington, DC to provide an overview of the cutting edge technologies, applications and programs under implementation in LAC. The objective of this high-level event was to share the main recommendations emerging from the Bank's Technical Note on how to effectively design programs the use technology to increase student learning[1]with key policy makers from the region together with experts in technology of education and representatives from the business sector. One of the emerging lessons from the analysis of solid empirical evaluations performed in this technical note is that the impact on academic areas tends to be greater in programs that guide the use of technology resources than in nonguided programs.

2.4 Second, a team of experts in education, technology and economics was assembled to produce a report on promising models to improve Math learning using technology consolidated in a digital book. To this end, the team analyzed the main challenges of Math learning in LAC and how different types of technology in education programs could be implemented to tackle these challenges. The final objective was to summarize rigorous evidence from different fields, including education, psychology and economics, to assess the relative advantages of alternative models to use technology for Math learning. An important focus in the analysis was to identify those models that were especially promising for the LAC context. The team of experts is currently in the process of finalizing the production of the book.

2.5 One of the emerging conclusions of the book is that certain technology in education programs seem especially suited to generate sizeable increases in learning at limited cost. These are the *supplementary computer assisted instruction* (or just supplemental CAI) models. These programs are characterized for using computer games and interactive learning activities that are adjusted to the learning level of the student to promote fluency and also understanding of Math concepts. Moreover, these programs require small

[1] Arias and Cristia (2014), "The IDB and technology in education: How to promote effective programs?", No. IDB-TN-670, Inter-American Development Bank.

adjustments to existing teaching practices and can reduce the workload of teachers regarding grading of exercises and assessments. Hence, these models show a high potential to be scaled up given the resources prevalent in schools in LAC.

2.6 Building on this analytical agenda, this TC will produce a toolkit that will summarize best practices on how to specifically design and implement supplemental CAI models to leverage access to computers and internet effectively for educational purposes. The objective is to provide a practical toolkit on how this type of programs should be structured to maximize the expected impacts and to ensure that typical challenges are successfully tackled. Moreover, the TC will fund data collection activities to document the effects of this type of programs in the LAC context. Finally, the TC will fund a series of dissemination activities to ensure that the main findings of this ongoing analytical agenda are incorporated in public policy discussions and inform critical government decisions in this area.

2.7 The TC will directly support the Bank's Broadband Special Program (BBD) by focusing on the development of education applications that leverage the learning opportunities allowed by increasing broadband access. In particular, this TC aims to support two critical aspects that the BBD seek to strengthen: i) development of the country's leadership in this area by identifying and disseminating best practices on the use of broadband for educational purposes; and ii) capacity building for governments in the region regarding adequate access, adoption and use of broadband services by producing practical guidelines for policymakers designing and implementing a broadband technology in education program (pillars 1 and 3 of the BBD). The TC is also aligned with the Bank's Strategy on Social Policy for Equity and Productivity, which establishes improving school quality as one of the priority areas for analytical work.

## III. DESCRIPTION OF ACTIVITIES AND OUTPUTS

3.1 The TC will fund the following activities:

3.2 **Component 1. Collection of data on promising models**. The TC will fund data collection activities aimed at documenting and quantifying the effects and the costs of the most promising models for Math learning such as the supplemental CAI described above. This model was identified as promising based on the theoretical and empirical evidence available but should be rigorously evaluated to determine its effect and scalability in LAC. In addition, this model seems suitable to produce positive effects in low-performing schools and thus, can also contribute to achieve equity in learning outcomes. Thus, this component will support the following activities: i) data collection on the technical requirements and costs for each of the components to design and implement a supplemental CAI model in LAC including the computers, access to broadband in the schools, teachers training, security, etc.; and ii) quantifying the effect on learning by supporting data collection of the evaluation of a CAI program in the region. The analysis in these two activities will provide information that does not exist in the region and that will allow to create the toolkit produced in Component 2. In addition, the data gathered in this component could complement the statistical information provided in the digiLAC platform.

3.3 **Component 2. Production of toolkits**. The TC will fund the production of a number of activities aimed at producing knowledge products that can inform policy making in the area of technology in education. In particular, the TC will fund the final edition of the book on promising models to improve Math learning using technology (including edition, translation and graphic design). As mentioned, one of the main conclusions of this book is that supplemental CAI models seem a promising option to improve Math learning with limited increases in public spending. Hence, this TC will fund the production of a toolkit focusing specifically on how supplemental CAI models should be structured to maximize learning effects. The expected analysis will include the four building blocks of these models: infrastructure, content, professional development and management. The production of this toolkit will require reviewing the existing qualitative and quantitative evidence to identify best practices in designing and implementing this type of models as well as the data collected in the first component. In particular, the toolkit will take into consideration the recommendations from the Broadband Policy Toolkit for Latin America and the Caribbean developed by IDB and the OECD on how policies to improve the access, adoption and use of broadband services.

3.4 **Component 3. Dissemination**. The TC will fund a series of activities to ensure wide dissemination of the main findings of the knowledge products generated. The dissemination strategy will identify the main audiences to be reached, the most important messages to deliver to these audiences and the best communication tools to convey these messages. The dissemination strategy will especially analyze how to leverage technological resources such as blogs, infographics and the use of social media to reach to a wide audience at low cost. These activities could include the development of videos and a short on-line course for policy-makers on how to design programs using technology to be given at the Training Center in Broadband for Central America and the Dominican Republic to connect with targeted audiences. The on-line course will summarize the main findings from the toolkit in how to design and implement a supplemental CAI model in LAC countries and will develop a step-by-step procedure. Both the videos and the on-line course should target a specific context and thus will require adapting the recommendations to a sub-set of Latin American Countries (for example Central America). Additionally, the TC will fund the organization of an international workshop (following up on the previous event it will be called *Schools Ready for Change II*) and webinars to discuss and analyze the main findings of the analytical products generated.

## IV. BUDGET

4.1 The following table describes the budget to fund the activities of the TC:

**Table IV-I: Indicative Budget**

| Activity/Component | Description | IDB/Fund Funding | Counterpart Funding | Total Funding |
|---|---|---|---|---|
| Data collection | Evaluating promising pilots | $50,000 | $0 | $50,000 |
| Generation of knowledge products | Analysis, writing and final edition of toolkits | $150,000 | $0 | $150,000 |
| Dissemination | Workshop, webinars, videos, on-line course | $100,000 | $0 | $100,000 |

## V. EXECUTING AGENCY AND EXECUTION STRUCTURE

5.1 The TC will be Bank executed. In the last few years, the Bank has executed several TCs in the area of technology in education including RG-T2337 funded by the Broadband Program described above and RG-T1968, which funded the evaluation of the One Laptop per Child program in Peru. Since 2011, the Bank has also been financing a range of activities aimed at understanding how to use technology in education effectively (ESW RG-K1217). The Bank has thus developed a competitive advantage in this area. As such, there will be a significant benefit in terms of knowledge sharing with and capacity building for, the counterparts if the Bank executes the 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 to be low. Because the TC will fund analytical and dissemination activities, no major operational risks are envisioned in the implementation process. The project team will focus on ensuring that all products are delivered on time and on avoiding delays in completing the TC.

## VII. ENVIRONMENTAL AND SOCIAL CLASSIFICATION

7.1 The ESG classification for this TC is “C”. There will be no potentially negative environmental and/or social impacts associated with this TC.