

## TC Document

### I. Basic Information for TC

▪ Country/Region:	BELIZE
▪ TC Name:	Evaluation Support for the Education Quality Improvement Program
▪ TC Number:	BL-T1159
▪ Team Leader/Members:	Naslund-Hadley, Emma Ingrid (SCL/EDU) Team Leader; Alejandra Forero Perez (SCL/EDU); Emma Findlater (CID/CBL); Greta Olivares (SCL/EDU); Lunstedt Tapia, Christian (VPC/FMP); Orchel Usher (CID/CBL); Sanmartin Baez, Alvaro Luis (LEG/SGO); Watson, Brodrick Raylando (VPC/FMP) Findlater (CID/CBL); Greta Olivares (SCL/EDU); Lunstedt Tapia, Christian (VPC/FMP); Orchel Usher (CID/CBL); Rieble-Aubourg, Sabine (SCL/EDU); Sanmartin Baez, Alvaro Luis (LEG/SGO); Watson, Brodrick Raylando (VPC/FMP).
▪ Taxonomy:	Operational Support
▪ Operation Supported by the TC:	BL-L1030
▪ Date of TC Abstract authorization:	24 Feb 2023.
▪ Beneficiary:	Belize
▪ Executing Agency and contact name:	Inter-American Development Bank
▪ Donors providing funding:	OC SDP Window 2 - Social Development(W2E)
▪ IDB Funding Requested:	US\$200,000.00
▪ Local counterpart funding, if any:	US\$0
▪ Disbursement period (which includes Execution period):	24 months
▪ Required start date:	May 2023.
▪ Types of consultants:	Individual consultants, consulting firms and other services
▪ Prepared by Unit:	SCL/EDU-Education
▪ Unit of Disbursement Responsibility:	SCL/EDU-Education
▪ TC included in Country Strategy (y/n):	Yes
▪ TC included in CPD (y/n):	Yes
▪ Alignment to the Update to the Institutional Strategy 2010-2020:	Gender equality; Social inclusion and equality

### II. Description of the Associated Loan/Guarantee

- 2.1 The Education Quality Improvement Program II operation ([EQIP II, BL-L1030; 4798/OC-BL](#)) is currently in execution. The development objective of [EQIP II](#) is to improve the quality and gender equity of education at the primary and secondary levels, with a special focus on innovation in Science, Technology, Engineering, Arts and Mathematics (STEAM) education. This general objective is being pursued by achieving the following specific objectives (i) Improve the quality of primary school teachers by expanding the inquiry- and problem-based learning approach; (ii) Improve the quality of secondary education teachers by improving teaching practices with a focus on student-centered science and mathematics learning; and (iii) promote gender-sensitive STEAM teaching.
- 2.2 In support of the second and third of these specific objectives, a STEAM Laboratory Secondary School is being created. A laboratory school is an elementary or secondary school operated in association with a university or educational institution.

The school is established with the goal of studying pedagogical practices to inform teacher training to improve student learning. In Belize, prior to the creation of the STEAM Laboratory School there was no infrastructure to host pedagogical innovations. Teachers make independent adjustments to their practices, but not in a system wide structured or systematic manner. The main assumption associated with the STEAM Laboratory School is that teacher professional development in pedagogy will lead to improvements in teaching practices. A second assumption is that improving teaching practices will lead to gains in student learning. To address the stark gender gaps in mathematics and science learning at the secondary level, the teacher professional development provided through the STEAM Laboratory school encompasses training in how to build girls' confidence in STEM, including supportive learning environments, role models and mentoring.

- 2.3 The Government of Belize has named the laboratory school [Itz'at STEAM Academy](#). The new secondary school is located on the Belize City Institution for Technical and Vocational Education and Training (ITVET) Campus and will open its doors to students in September 2023. Teacher training through the school has already initiated through the training of 92 mathematics and science secondary education teachers from 26 high schools.

### III. Objectives and Justification of the TC

- 3.1 Belize's youth is not equipped with the competencies demanded by the labor market. An Inter-American Development Bank (IDB)-financed employability gap analysis concludes that Belize's ability to innovate is predicated on the readiness of a large pool of talented individuals with expertise in Science, Technology, Engineering, and Mathematics (STEM) subjects. The study calls for training not only in STEM, but in Science, Technology, Engineering, Arts and Mathematics (STEAM). The abilities that are in highest demand by employers in Belize are those needed to face the Fourth Industrial Revolution (4iR)<sup>1</sup>: STEAM skills, teamwork, social skills, communication, responsibility, and digital abilities<sup>2</sup>. These are skills needed in the Information & Communication Technology (ICT) industry, one of the industries with the highest expected growth,<sup>3</sup> where firms lack digital competencies for middle skill jobs in software, web development, and database networking (Näslund-Hadley, Navarro & Prada 2019). They are also key to the transformation to a greener economy ([GIZ & Paeradigms 2023](#); [Pavlova, Margarita 2019](#); [ILO 2019](#)).
- 3.2 The skill mismatch is compounded by low levels of learning. The COVID-19 pandemic and its related school closures led to a decrease in the rate of learning. In line with international trends, large losses were recorded in foundational skills. The average mathematics score among 5th graders dropped by 36% between the 2018/19 and 2021/22 school years (Näslund-Hadley et al., 2023). In the 8<sup>th</sup>-grade (standard 6), the average mathematics score dropped by 41%. In English language,

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<sup>1</sup> The 4iR is characterized by a range of new technologies that are needed to fuse “the physical, digital, and biological worlds, impacting all disciplines, economies and industries (Klaus Schwab, 2022)

<sup>2</sup> In the survey, digital competency was defined as confident and critical use of electronic media for work, leisure, and communication.

<sup>3</sup> According to the World Development Indicators (WDI) data, ICT services account for 12% of Belize's services up from 4.3% in 2019 (UNESCO Institute for Statistics).

the average test score decreased by 26% among 5th graders and 15% among 8<sup>th</sup> graders (Näslund-Hadley et al., 2023).

- 3.3 Belize has a gender learning gap in Mathematics and Science learning. Gender learning gaps appear to develop over time as gaps are small and significant only in some academic years on the Primary School Examination (PSE). By the time students reach the secondary level of education, the gap is pronounced with boys outscoring girls on the Caribbean Secondary Education Certificate (CSEC) examination by 14.2% and 12.5% in mathematics and science, respectively. Belizean girls also experience higher rates of anxiety around mathematics than their male peers and have lower self-efficacy in mathematics (Richland et al, 2019). An IDB survey shows that 4% of girls sense that they belong in the exact science fields, compared with 37% of boys (IPA, 2022). By the time students reach the tertiary level, fewer women choose to pursue careers in exact sciences.<sup>4</sup> Consistent with the Latin America and the Caribbean (LAC) average, Belizean women represent only 34% of students in exact science fields while they represent almost 60% of students in other fields, making women an untapped resource for economic growth, especially given the demand for 4iR skills (Gupta & Kabeish, 2023).
- 3.4 To close the skill mismatch and gender learning gap, [EQIP II](#) supports the creation of the Itz'at STEAM Academy. The Massachusetts Institute for Technology (MIT) has designed the learning program of the new school. The mission of the STEAM Academy is to create a diverse and inclusive school community that inspires young people—including girls, those from marginalized social, economic, or cultural groups and those with special educational needs—to advance their knowledge and understanding of the world and to engage in concrete actions that lead to improvement of their own lives and the lives of those around them. The key learning areas of the STEAM Academy are sustainable environments, global humanities, quantitative reasoning, arts and fabrication, and healthy living. Additionally, students will do an internship and senior capstone.
- 3.5 To assess the effectiveness of the STEAM Laboratory School on student achievement and sense of belonging in STEM, the Government of Belize is currently financing the collection of the baseline data on student applicants to the STEAM Lab School. Data collection will take place before the start of the school year in September 2023. The Ministry of Education, Culture, Science, and Technology has contracted Innovation for Poverty Action (IPA) to collect the baseline for the evaluation. IPA will design the randomization of students applying to enter the STEAM laboratory school and apply surveys of teachers and students and student assessment of STEAM skills at the beginning of the 2023/24 academic year. They will also design and maintain a database with information on the participating students and teachers and draft a final evaluation report.
- 3.6 Based on the IDB's extensive experience with experimental evaluations in the education sector, the Government of Belize has asked for assistance in collecting the follow-up measures. This proposed Technical Cooperation (TC) will finance

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<sup>4</sup> Exact sciences are those whose laws are capable of precise quantitative expression (e.g., physics, chemistry, or astronomy).

endline data collection for the 2023/24 academic year as well as data collection for the 2024/25 academic year.

- 3.7 **Objective.** The objective of the TC is to support the Government of Belize with the evaluation of the [EQIP II](#) program. The specific objective is to measure the effects of [EQIP II](#) to improve the quality of education at the secondary level, with a special focus on innovation in STEAM education.
- 3.8 This TC will support the [4798/OC-BL](#) loan operation by experimentally evaluating its activities, characteristics, and outcomes. The impact evaluation will entail a Randomized Controlled Trial (RCT) to assess the effect on student learning in the STEAM Laboratory School. The rationale for the RCT is that prior to training all pre-service and in-service secondary education STEAM teachers at the Laboratory School, it is necessary to make sure that any learning improvements can be attributed to the training.
- 3.9 **Strategic Alignment.** The TC is consistent with the Second Update to the Institutional Strategy (UIS) 2020-2023 (AB-3190-2) and is aligned with the development challenges of Social Inclusion and Equality by evaluating students' access to quality basic education. The TC is aligned with the cross-cutting issue of gender equality by seeking to close the gender gaps in STEM and the training of teachers in gender sensitive pedagogical practices. The TC will contribute to the Corporate Results Framework (GN-2727-12) by measuring the number of students benefitted by education projects. The TC is consistent with the Sector Framework Document for Skills Development (GN-3012-4) by measuring high-quality learning opportunities. It is aligned with the current IDB Group Country Strategy with Belize 2022-2025 (GN-3086), which prioritizes the building of skills for the post-COVID19 economy. The proposed operation is aligned with the national Belize Education Sector Plan ([BESPlan](#)), which seeks to close learning gaps that widened during the COVID-19 pandemic and foster digital and STEAM skills. This TC is also aligned with a new operation the Bank is preparing to support skills in Belize (BL-L1044). The results from this TC's evaluation would be useful in informing the new operation's preparation and kick-off. Additionally, the TC is also aligned with objective (iii) of priority area 5 of the Ordinary Capital Strategic Development Program (OC SDP) Window 2, Inclusive Social Development (W2E) that supports the reduction of poverty and inequality through students' access to quality basic education and fosters social inclusion, gender equality by closing gender gaps in STEM, and training teachers in gender sensitive pedagogical practices ([GN-2819-14](#)).

#### IV. Description of activities/components and budget

- 4.1 **Component 1. Evaluation of [EQIP II](#) (US\$180,000).** The aim of the component is to critically examine the effect of the STEAM Laboratory School on student achievement and sense of belonging in STEM fields. For the assessment of student learning and economic returns, TC resources will finance the contracting of a firm to conduct an experimental evaluation. The acceptance of student applicants to the school will be randomized to assess its effect on STEAM learning, including sense of belonging in STEM; expectations; problem-solving and critical thinking skills. The evaluation will take place at the student level. A difference in averages between students who are enrolled in the laboratory school to those which do not would provide an estimate of program impacts on the quality of education. The main

evaluation questions of the program are whether the assumptions implied by the proposed solutions will lead to the achievement of objectives. These questions include: (i) Will the creation of a STEAM Laboratory School and teacher training at the secondary level lead to better pedagogical practices by teachers?; (ii) Will the creation of a STEAM laboratory school and teacher training at the secondary level lead to more gender sensitive pedagogical practices by teachers?; (iii) Will improved pedagogical practices at the secondary level lead to student learning?; and (iv) Will improved pedagogical practices to promote gender inclusion lead to changes in students' attitudes on STEM subjects?

- 4.2 **Component 2. Dissemination (US\$20,000).** The TC resources will be used to finance the dissemination of the findings. Specifically, the dissemination activities will include the contracting of an individual consultant to assist with the development of a publication and financing of editing and translation services, as well as logistics for a workshop in Belize to present the findings of [EQIP II](#).
- 4.3 **Budget.** The total cost of the TC is US\$200,000, which will be charged against the OC SDP Window 2 - Social Development (W2E)-. A counter-part funding is not expected.

Indicative Budget (US\$)			
Activity/Component	Description	IDB	Total Funding
<b>Component 1. Evaluation</b>		<b>180,000</b>	<b>180,000</b>
Experimental evaluation	Consultancy firm	180,000	180,000
<b>Component 2. Dissemination</b>		<b>20,000</b>	<b>20,000</b>
Drafting of note	Individual consultant	15,500	15,500
Editing and translation	Services	3,000	3,000
Workshop logistics	Services	1,500	1,500
<b>Total</b>	-	<b>200,000</b>	<b>200,000</b>

- 4.4 **Monitoring.** The development of all products will be closely coordinated by SCL/EDU who will provide guidance to ensure that the products will meet the needs and standards of the Bank. The Project Team will be responsible for the review of all technical and financial reporting. The Team Leader will be responsible for monitoring activities in the field, and continuous progress meetings with the counterparts and consultants.

## V. Executing agency and execution structure

- 5.1 The IDB through the Education Division (SCL/EDU) in collaboration with the country office (CID/CBL) will execute this TC. The Government has requested that the IDB execute the TC due to its long trajectory in education evaluations and history with the program. This is consistent with Appendix 10 in the Operational Guidelines for Technical Cooperations (as modified Annex 2 of OP-619-4), which identifies the need of a strong institutional, operational, and technical capacity for the execution of the contemplated activities in this TC.
- 5.2 **Execution and disbursement period.** The TC will be executed over a period of 24 months and disbursed over a period of 24 months as of the date of approval.

- 5.3 **Procurement.** The activities to be executed are included in the Procurement Plan (Annex IV) and the Bank will contract individual consultants, consulting firms and other services in accordance with current Bank procurement policies and procedures. The Bank will contract the services of individual consultants in accordance with Section AM-650 of the Administrative Manual “Complementary Workforce”; logistics and other related services in accordance with the IDB Corporate Procurement Policy (GN-2303-28); and consulting firms for services of intellectual nature in accordance with the Policy for the Selection and Contracting of Consulting Firms for Bank-Executed Operational Work (GN-2765-1) and its Operational Guidelines (OP-1155-4).
- 5.4 **Single Source Selection.** Direct contracting is foreseen of Innovations for Poverty Action (IPA) in the amount of approximately US\$180,000 to undertake the impact evaluation of BL-L1030. This will entail an experimental assessment of the effect on student learning in the STEAM Laboratory School, and the effect on teaching practices in Belize’s secondary schools. The SSS of IPA is consistent with 4.1.3(a) of the Policy for the Selection and Contracting of Consulting Firms for Bank-executed Operational Work (GN-2765-4) which allows for single-source selection because it’s a task that represents a natural continuation of previous work carried out by the firm, directly for the Bank or in the context of a Bank project, and only this firm is qualified or has the experience of exceptional worth for this assignment and it presents a clear advantage over competition. As indicated in paragraph 3.5 above the MoECST has contracted IPA with loan resources (BL-L1030) to undertake the evaluation of EQIP II. This contract is currently in execution. This SSS is also in line with 4.1.3 (d) of the same policy. IPA has exceptional value as the non-governmental organization has completed over 900 experimental impact evaluations across the globe and has another 100 RCTs ongoing. Some 100 of these experimental evaluations are in the education sector. To the best of our knowledge, no other consultancy firm has undertaken as many randomized control trials, nor as many in the education sector. As IDB consultants, IPA has successfully conducted a wide spectrum of impact evaluations using a randomized design. Their work is consistently of superior quality.
- 5.5 All deliverables and any other material prepared under this TC are the sole and exclusive property of the Bank, and as such, the Bank has title, rights (including copyrights) and exclusive interests in the ownership of said products.

## **VI. Major issues**

- 6.1 The risks to project execution are reduced by being directly executed by the IDB. Although the execution of a pilot based on an experimental design in a context such as Belize always presents certain logistical challenges, the IDB has years of experience working with schools in remote areas, including service delivery in rural and urban marginalized schools. A risk is connected to the proposed evaluation methodology of randomization in such that the random assignment may not be respected during program implementation.

## **VII. Environmental and Social Strategy**

- 7.1 This Technical Cooperation is not intended to finance pre-feasibility or feasibility studies of specific investment projects or environmental and social studies

associated with them; therefore, this TC does not have applicable requirements of the Banks Environmental and Social Policy Framework (ESPF).

**Required Annexes:**

[Request from the Client - BL-T1159](#)

[Results Matrix - BL-T1159](#)

[Terms of Reference - BL-T1159](#)

[Procurement Plan - BL-T1159](#)

\* If TC Document is sent for BOD approval, the only Annexes that need to be translated are the Results Matrix and the Procurement Plan. The Request from Client and the ToRs should be included as links and no translation is required.