PUBLIC
SIMULTANEOUS DISCLOSURE

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

ECUADOR

REDUCTION OF THE DIGITAL DIVIDE IN EDUCATION IN ECUADOR

(EC-L1282)

LOAN PROPOSAL

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REQUIRED:

1. Multiyear execution plan/annual work plan
2. Monitoring and evaluation plan
3. Environmental and social management report
4. Procurement plan

OPTIONAL:

1. Project Economic Analysis
2. Climate Change Annex
3. Mapping of Ministry of Education initiatives regarding the digital transformation of education
4. Operating Regulations

ABBREVIATIONS

CNT	Corporación Nacional de Telecomunicaciones
ENEMDU	Encuesta Nacional de Empleo, Desempleo y Subempleo [National Employment, Unemployment, and Underemployment Survey]
IT	Information technology
MEF	Ministry of Economy and Finance
MINEDUC	Ministry of Education

PROJECT SUMMARY

ECUADOR
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Financial Terms and Conditions				
Borrower:			**Flexible Financing Facility[a]**	
Republic of Ecuador			**Amortization period:**	25 years
Executing agency:			**Disbursement period:**	4 years
Ministry of Education			**Grace period:**	7.5 years[b]
Source	**Amount (US$)**	**%**	**Interest rate:**	SOFR-based
IDB (Ordinary Capital):	45,000,000	100	**Credit fee:**	[c]
			Inspection and supervision fee:	[c]
Total:	45,000,000	100	**Weighted average life:**	15.25 years
			Approval currency:	U.S. dollar

Project at a Glance
Project objective/description: The general objective of the program is to promote successful education pathways for Ecuador's students. The specific objective is to encourage more effective teaching processes.
Special contractual clauses precedent to first disbursement of the loan: The borrower, through the executing agency, will provide evidence that (i) the program Operating Regulations have entered into force, in accordance with the terms previously agreed with the Bank; and (ii) the technical coordination team has been created with key support staff, including a financial management specialist, a legal specialist, a planning and monitoring specialist, and a procurement specialist (paragraph 3.3). **Special contractual conditions for execution:** Prior to the first bidding process for the purchase of the devices described in paragraph 1.30, the Ministry of Education will submit evidence to the Bank that it has an onboarding plan for the digital infrastructure (paragraph 1.20) (paragraph 3.4)
Exceptions to Bank policies: None.

Strategic Alignment			
Challenges:[d]	SI ☒	PI ☒	EI ☐
Crosscutting themes:[e]	GE ☐ and DI ☒	CC ☒ and ES ☒	IC ☐

(a) Under the terms of the Flexible Financing Facility (document FN-655-1), the borrower has the option of requesting changes to the amortization schedule, as well as currency, interest rate, commodity, and catastrophe protection conversions. The Bank will take operational and risk management considerations into account when reviewing such requests.

(b) Under the flexible repayment options of the Flexible Financing Facility, changes to the grace period are permitted provided that they do not entail any extension of the original weighted average life of the loan or the last payment date as documented in the loan contract.

(c) The credit fee and inspection and supervision fee will be established periodically by the Board of Executive Directors as part of its review of the Bank's lending charges, in accordance with the relevant policies.

(d) SI (Social Inclusion and Equality); PI (Productivity and Innovation); and EI (Economic Integration).

(e) GE (Gender Equality) and DI (Diversity); CC (Climate Change) and ES (Environmental Sustainability); and IC (Institutional Capacity and Rule of Law).

I. Description and Results Monitoring

A. Background, problem to be addressed, and rationale

1.1 **Country context.** Following the pandemic, Ecuador made notable progress in strengthening the policy framework that drove economic growth, poverty reduction, and fiscal consolidation. Gross domestic product (GDP) grew 4.2% in 2021 [1] and 2.9% in 2022 [2]; poverty declined from 33% in 2020 to 25.2% in 2022;[1] and the government posted a primary fiscal surplus of 1.6% of GDP in 2022. Nonetheless, the recent surge in global interest rates and the decline in the price of oil have put additional pressure on fiscal accounts. With respect to the political situation, the election process expected to elect new executive and legislative authorities is being carried out in an orderly manner with elections on 20 August 2023 and continuity of activities in the public and private sectors.

1.2 **Ecuador's education system** has more than 4 million students distributed across three levels: pre-primary, for 3- and 4-year-olds (7%); basic general education, consisting of 10 grades for students aged 5 to 14 (71%);[2] and upper secondary, comprising 3 grades for students aged 15 to 17 (21%) (General Regulations for the Intercultural Education Act, 2023). Schools in urban areas serve 73% of all students, while 27% attend rural schools. Ecuador has achieved a high level of coverage in basic general education, with a 92% gross enrollment rate at this level (Ministry of Education (MINEDUC), 2022). Despite this progress, many children and adolescents in Ecuador fail to successfully complete their education, with low enrollment rates in rural areas, low levels of learning, and low enrollment rates at the upper secondary level.

1.3 **There are significant enrollment gaps in basic general education between students in urban and rural areas.** The gross enrollment rate in rural areas is 62% at that level, compared with 109% in urban areas (MINEDUC, 2022). In response, the National Development Plan 2021-2025 proposes to increase rural basic general education enrollment rates to 64.5% by 2025. Many rural schools in Ecuador have only one or two teachers (60%),[3] while the vast majority of bilingual intercultural schools that serve pupils belonging to indigenous nations and peoples are located in rural areas (78%). Gross basic general education enrollment rates among indigenous students are also low, at approximately 52%.[4]

1.4 **Students exhibit low levels of learning.** Some 64% of 4th grade children do not achieve minimum standards in mathematics (satisfactory or excellent), and 57% still fail to reach these levels of learning by the end of the basic general education cycle (10th grade) (Ser Estudiante, 2022). In the case of indigenous students and those living in the Amazon region, 65% of pupils in the 10th grade of basic general

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1 Poverty is defined as receiving a per capital household income of less than US$88.72 per month.

2 Basic general education is split into basic preparatory (Grade 1), basic elementary (Grades 2, 3, 4), basic middle (Grades 5, 6, and 7), and basic higher (Grades 8, 9, and 10).

3 These schools have one or two teachers who serve multiple grades and are generally small schools with an average of 20 pupils.

4 The gross enrollment rate for pupils from indigenous nationalities and peoples was estimated by taking the share of the indigenous population aged between 5 and 14 years in the cumulative National Employment, Unemployment, and Underemployment Survey (ENEMDU) for 2022.

education fail to achieve minimum standards in mathematics. Results in language and literature are similar. The COVID-19 pandemic aggravated the situation, as Ecuador had some of the longest school closures in the region. Simulations indicate that the proportion of 3rd grade students who fall short of minimum standards in mathematics has grown by approximately 20 percentage points, above the estimated regional average (17 percentage points) (World Bank, 2022). Achieving minimum academic standards is key for ensuring that students successfully complete their schooling—in other words, without delay or dropping out (Rumberger and Rotermund, 2012).

1.5 **Enrollment gaps and low levels of learning in basic general education affect student enrollment at the upper secondary level.** The gross upper secondary enrollment rate for the country as a whole is 88%, with large differences between urban and rural areas: 110% in urban areas and only 49% in rural ones (MINEDUC, 2022). The proportion is even lower for indigenous students (41%).[5] The government is committed to fostering higher rates of student participation in secondary education in Ecuador and has set a target of 89% for the gross upper secondary enrollment rate by 2025.

1.6 High failure rates in the education pathways of Ecuadorian students, as reflected in the low enrollment rate (particularly in rural areas) and low levels of learning, are partly the result of low teaching effectiveness (Grossman et al., 2013; Garrett and Steinberg, 2015; Stipek and Chiatovich, 2017).[6] Two challenges influence the low effectiveness of teaching processes in Ecuador today: (i) innovative teaching practices are not generally used, and (ii) teachers are inadequately trained.

1.7 **Innovative teaching practices are not generally used.** Most teachers in Ecuador base their classes on traditional methods that focus on memorization and repetition (Calle-Suáres and Quichimbo-Rosas, 2021), as well as frontal, transmissive teaching models that view the student as a passive recipient of knowledge (Torres, 2016). They do not generally use education methods that foster critical thinking and personalized teaching strategies (Cantuña and Cañar, 2020; Cedeño and Vigueras, 2022). In addition, Ecuadorian teachers rely to a large extent on textbooks for planning and preparing their lessons; they do not use flexible, adaptable materials that are connected with real-time knowledge production (Instituto Nacional de Evaluación Educativa, 2022; López, 2019; Oña and Oña, 2017).

1.8 **Many teachers lack adequate education and training.** The "Ser Maestro [Being a Teacher]" assessment program, which measures the specific knowledge of Ecuadorian teachers, showed that 67% of teachers in central government schools exhibit only "basic" or "developing" levels of performance and therefore require training programs to improve their performance (Ser Maestro, 2016).[7] The proportion of

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5 The gross enrollment rate for pupils from indigenous nationalities and peoples was estimated by taking the share of the indigenous population aged between 15 and 17 years in the cumulative National Employment, Unemployment, and Underemployment Survey (ENEMDU) for 2022.

6 Failures in education pathways are the outcome of different factors, some of which relate to school processes, while others are determined by factors outside schools (e.g., community- and family-related factors) (Stearns and Glennie, 2006; Rumberger, 2020). This program focuses on one specific school-related factor: the quality of teaching processes.

7 The Ser Maestro assessment has four categories: excellent, good, basic, and in development.

teachers that performed poorly on this assessment was 65% in urban areas and 71% in rural ones. This is also reflected in the "Ser Estudiante [Being a Student]" surveys, in which 53% of teachers indicated that they needed some type of professional development to improve their classroom skills (there was no significant difference between rural and urban areas) (Ser Estudiante, 2022). In addition, many teachers lack advanced professional training. Only 16% have a postgraduate degree (e.g., a master's or doctorate), and there is still a subset of teachers (2%) who do not have university degrees (a prerequisite for classroom teaching). Most of the latter group are intercultural bilingual teachers in areas with indigenous communities.

1.9 The Government of Ecuador is focusing on technology transformation as a means of improving teaching processes. Technology is key for allowing teachers to both improve and diversify the teaching content and practices used in the classroom and to access the professional development opportunities that are increasingly delivered using virtual modalities (Darling-Hammond and Hyler, 2020). Despite this, many teachers in Ecuador do not yet use technology in their teaching processes in any generalized way, or in their own education.

1.10 MINEDUC has expanded the range of digital resources available to strengthen teaching practices, but their use remains limited. It has created a portal with 950 open digital educational resources that allow teachers to develop innovative teaching experiences while providing greater empowerment and autonomy in the learning process. The portal also includes materials and stories for children that cover intercultural and ethnoeducational topics, organized by the Intercultural Bilingual Department. The digital resources are available for teachers to use in the classroom and during activities under the extended school day program, in which students, teachers, and other members of the education community meet in schools after classes to participate in extracurricular or after-school activities or student clubs. However, few teachers use these resources to improve students' learning experiences. According to the Ser Estudiante 2022 survey, 46% of students stated that their teachers do not use technology to strengthen content presentation in the classroom. Moreover, 57% indicated that their teachers do not use technology to expand and improve practical opportunities in class (e.g., through project-based learning or teamwork).

1.11 Teachers also make little use of technology for their professional development. MINEDUC currently uses technology to promote professional development for teachers on a large scale, and all MINEDUC continuous training programs are available online through the Mecapacito platform. This provides professional advancement courses for teachers that address variety of topics, including courses to strengthen teaching in rural and multigrade schools (where indigenous pupils have a greater presence) and technopedagogical courses that guide teachers in how to make effective use of technology in the classroom. In addition to the courses available through Mecapacito, a number of education foundations have provided more than 100 continuous training courses for public school teachers over the last 10 years under agreements with MINEDUC. Most of these courses have been provided virtually. Despite the wide range of virtual courses available for professional development, only 28% of teachers enrolled in one or more continuous training programs in 2022 (MINEDUC, 2022).

1.12 In addition to the courses already available through the Mecapacito platform, MINEDUC will provide advanced virtual postgraduate training courses for central government school teachers under the "Formar para Transformar (Training for Transformation)" investment project.[8] The IDB is also developing a virtual course with MINEDUC to train teachers in digital citizenship, allowing them to teach their students how to interact more responsibly in the digital world. The project is being financed under the technical cooperation operation "Education for the 21st Century: Prospering, Competing, and Innovating in the Digital Era" (ATN/OC-18790-RG, ATN/OC-18791-RG).

1.13 The limited use of technology for teaching and professional development is partly associated with poor access to technology infrastructure on the part of teachers and schools in Ecuador. In 2017, only 61% of teachers had a laptop computer or tablet for personal use (ENEMDU, 2017). In 2021-2022, only 27% of central government schools in rural areas had a computer lab, compared with 44% in urban areas. In the same year, only 37% of rural central government schools had an internet connection, while in urban areas the proportion was 60%.[9] The percentage of schools that are connected is even lower for intercultural bilingual schools (31%) and schools located in Amazon provinces (35%). School closures due to the COVID-19 pandemic led to the deterioration and loss of already limited technology infrastructure in schools, owing to a lack of maintenance of education facilities (MINEDUC, 2022).

1.14 The limited use of technology in teaching may also be a result of apprehensions among teachers with respect to the integration of technology into their teaching processes (Howard, 2012). Risk aversion surrounding the use of technology can discourage teachers from using digital resources to innovate in their teaching practices, leading them to continue adopting traditional approaches in their educational activities. Evidence shows that younger teachers in Ecuador are more open to incorporating digital solutions into their practices, and this may represent an imminent cultural shift in the approach to teaching (Valdivieso and Gonzáles, 2016).

1.15 **Rationale.** MINEDUC has approved an Education Sector Plan 2021-2025 that introduces systemic changes to education in Ecuador with the aim of equipping students with the skills necessary to prosper in a changing and competitive world. The plan promotes reforms to various spheres of education, including the Digital Agenda for Education, which is crosscutting, as a necessary enabling factor for implementing changes in the sector plan, both in form (using technology) and in content (about technology).

1.16 As part of the Education Sector Plan 2021-2025, MINEDUC has implemented multiple actions that use technology to improve teaching processes. These actions include, for example, the "Formar para Transformar" investment project, which finances virtual teacher training courses with resources from the Development Bank of Latin America

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[8] Schools in Ecuador are divided into four funding categories: central government public, municipal public, charter, and private. Central government and municipal public schools are public institutions managed by the central and local governments, respectively. Charter schools ("escuelas fiscomisionales") are private institutions that receive public funding, while private schools are profit-seeking and receive no public funding.

[9] Some schools have connections for administrative purposes, but these cannot be used for teaching purposes at the student level due to a lack of adequate infrastructure.

(CAF); the "Reforma Integral al Bachillerato" investment project, which finances the inclusion of digital competencies in the secondary education curriculum with resources from CAF; and the "Prevención y abordaje de Riesgos psicosociales en el entorno educativo" investment project, which uses fiscal resources to finance the development of digital educational resources to prevent and address psychosocial risks. In addition to these investment projects, MINEDUC has technical cooperation programs in which technology plays a key role, for example, the "Programa Multianual de Resiliencia para la Inclusión Educativa" with United Nations agencies, which includes financing of digital resources for inclusive education; the technical cooperation operation financed by the Organization of Ibero-American States for the development of teacher training courses on teaching methodologies linked to the use of educational technology; and the technical cooperation operation with the IDB for the production of teacher training materials and courses on digital citizenship (see the mapping of these and other actions by MINEDUC related to the use of technology for teaching in optional link 3).

1.17 However, in order for teachers to benefit from these actions, it is essential that they have access to technological infrastructure. Given the wide digital gap in education in the country, the Government of Ecuador has approved an investment project to expand access to technology for teachers and schools in the country. The project, called "Reducing the Digital Gap in the National Education System," is for US$92.5 million,[10] and it seeks to provide digital devices and connectivity to schools with the highest rates of digital exclusion. To support the financing of this project, the Government of Ecuador has requested this Bank loan operation to help to reduce the gap in access to digital technology on the part of teachers and schools. Accordingly, it will create the enabling conditions for implementing digital education actions that foster the effective use and integration of technology into teaching processes.

1.18 Technology can improve teaching processes and students' educational results in several ways. First, technology can make teaching materials and content more attractive and diversified, enhancing students' involvement in the learning process (United Nations Organization for Education, Science, and Culture, 2019). In addition, it can improve educational outcomes by helping teachers to adapt their classes, providing differentiated and personalized instruction based on students' needs (Ganimian et al., 2020). The effective inclusion of in-person and virtual educational spaces integrated into the curriculum also creates more effective forums for teaching and learning, in which students play an active role not only as consumers but also as creators of digital education resources (Arias Ortiz et al., 2020; Opertti, 2021). Technology can also be used strategically to improve the quality of teachers, increasing their access to and participation in professional development programs (Wilichowski et al., 2021).

1.19 For technology to promote improved teaching processes and more successful education pathways, teachers must use digital infrastructure for teaching purposes (Arias Ortiz and Cristia, 2014; Araya et al., 2019; Cristia and Vlaicu, 2022).

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[10] The Bank will finance US$45 million of this investment project, with the remainder financed by fiscal resources and funding from other multilateral organizations.

To promote the use of digital infrastructure, the delivery of devices (laptops) by the program to teachers is subject to participation in training courses (paragraph 1.33).

1.20 In addition, MINEDUC will use its own resources to implement an onboarding plan for program beneficiaries that will include: (i) training in the proper use of technological devices (e.g., initial operation of the devices and use of the software installed on the equipment); (ii) technopedagogical training on the application of active methodologies[11] in the classroom through technology; and (iii) training on how to use MINEDUC's educational resources portal and the Mecapacito platform. The Bank will use technical cooperation funding to provide support for the design of this onboarding plan, which will include awareness raising campaigns with school district coordinators and the schedule for the execution of training processes. As established in paragraph 3.4, MINEDUC will have the onboarding plan prior to the start of the first bidding process for the purchase of the devices.

1.21 The teachers will also have additional incentives to use the digital infrastructure, since completion of courses on the Mecapacito platform is a requirement for pursuing a teaching career and securing promotions.

1.22 **Bank experience in the sector and country.** Through its use of loan and technical cooperation operations, the Bank has been assisting the country to strengthen education access and improve the equity and quality of education. The most recent loans include the "Support Program for the Social Inclusion of People with Disabilities in Ecuador," which has a US$7.6-million component for strengthening specialized and inclusive education (loan 4634/OC-EC) and the "Multiphase Program to Improve Quality in the Delivery of Social Services – Phase I," which includes a US$3.5-million component to improve the quality of educational services (loan 4364/OC-EC). Technical cooperation operations include the Inclusion of Migrants Into School System (technical cooperation operation ATN/OC-17520-EC); and two operations to improve and optimize the assignment of teachers (technical cooperation operations ATN/OC-16910-EC and ATN/OC-18274-EC). In addition, the Bank has been supporting the countries of the region through education loan operations with substantial digital components over the last decade (e.g., loan 4290/OC-UR), as well as technical cooperation operations to create regional public goods that help education systems to manage the changes associated with the digital transformation in education (ATN/OC-18130-RG and ATN/OC-19645-RG). The Bank is also preparing a conceptual framework for the digital transformation in education ("Accelerating Education 4.0: A Roadmap for the Digital Transformation in Education") which will be used as a technical input for this project.

1.23 **Lessons learned.** This operation incorporates lessons learned from several operations in the region with digital components. First, interventions must be tailored to the level of maturity of the education system for digital transformation, in terms of both management (ATN/OC-18102-RG) and teaching practices (ATN/OC-19645-RG). The distribution of devices for teaching must also be combined with technopedagogical training for teachers in strategic areas (loan 4290/OC-UR). To this end, application of

[11] Active methodologies replace processes of learning by memorization with interactive processes between students and teachers. There are various active methods of teaching, such as project-based learning, the flipped classroom, gamification, cooperative learning, problem-based learning, etc.

the Edutech Guide will be included to evaluate teachers' levels of technology adoption and digital skills.[12] The results of this evaluation will provide personalized feedback to teachers, with guidance regarding their professional development (including MINEDUC courses to promote the effective use of technology in teaching processes).

1.24 Second, it is important that digital infrastructure be coordinated with initiatives that encourage the integration of technologies into teaching and learning processes (loan 4290/OC-UR). Accordingly, a mapping has been carried out of initiatives under MINEDUC's Digital Agenda for Education (optional link 3), and a program execution structure has been designed that formalizes coordination and cooperation between these initiatives and the lines of investment in the program (optional link 4). Execution will include onboarding strategies to encourage and strengthen the ability of students and teachers to effectively use the devices (paragraph 1.19).

1.25 Third, in light of the execution challenges in IDB programs led by MINEDUC (loans 4634/OC-EC and 4364/OC-EC), the Bank will need to work in close collaboration with MINEDUC teams to (a) reduce the risks associated with a lack of budget allocations for the program (paragraph 2.4); and (b) provide technical and fiduciary support to the MINEDUC management team so as to avoid delays in reviewing processes and issuing the enabling documents for launching procurement processes. At present, central government technology purchases must be reviewed and approved by the Ministry of Telecommunications and the Information Society. MINEDUC must submit the documents required for approval by the Ministry in a timely manner in order to avoid delays to the procurement processes for the devices (loan 4364/OC-EC).

1.26 **Strategic alignment.** The program is consistent with the second Update to the Institutional Strategy (document AB-3190-2) and is aligned with the challenges of (i) productivity and innovation, through the use of digital and information technology; and (ii) social inclusion and equality, by improving the efficiency and quality of education services, including for students in situations of vulnerability. It is aligned with the crosscutting area of (i) climate change and environmental sustainability, as the provision of energy-efficient digital equipment will result in an estimated 58.89% of resources being dedicated to climate financing, according to the multilateral development banks' joint methodology; and (ii) diversity, through improvements in connectivity and access to technological devices for teaching in the intercultural bilingual schools attended by indigenous students. In addition, the project will contribute to the Corporate Results Framework (document GN-2727-12), through the indicator of the number of students benefited by education projects.

1.27 Analysis of the operation using the multilateral development banks' joint methodology for the IDB Group Paris Alignment Implementation Approach (PAIA) (document GN-3142-1) yields the following conclusions: (i) it is aligned with the Paris Agreement adaptation target, and (ii) it is universally aligned with the Paris Agreement mitigation target (optional link 2).

1.28 The project is also aligned with the IDB Group Country Strategy with Ecuador 2022-2025 (document GN-3103-1), contributing to its strategic objectives of

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[12] A more detailed explanation of the Edutech Guide can be found in the annex to the program's monitoring and evaluation plan. This application will be used to establish baseline values for the Results Matrix.

expanding the coverage and quality of physical and technological infrastructure and expanding access to and improving the coverage of basic and social services (specifically education services). It is consistent with Line of Action 1 of the Gender and Diversity Sector Framework Document (document GN-2800-13)—"Address gaps that arise from structural factors"—and is aligned with the IDB Group Gender and Diversity Action Plan 2022-2025 (document GN-3116-1) as regards its priority area of improving human capital, as it strengthens intercultural bilingual education for indigenous peoples. Given its nature, the operation is not gender-aligned, as it focuses on investments in digital infrastructure through the delivery of technology kits for schools and teachers, equally benefiting all children attending the schools (male and female). It is also consistent with the Skills Development Sector Framework Document (document GN-3012-3), as it ensures access to opportunities for relevant learning and a high quality of life for children and adolescents in Ecuador; it also leverages the use of technology to expand equitable access to skills development opportunities. The program is included in Annex III of the 2023 Operational Program Report (document GN-3154-1).

B. Objectives, components, and cost

1.29 The general objective of the program is to promote successful education pathways for Ecuador's students. To this end, the specific objective is to encourage more effective teaching processes. To achieve these objectives, the program will narrow the digital gap between schools in Ecuador through investments in digital infrastructure, which is a necessary condition for promoting the use and effective integration of technology into teaching processes.

1.30 **Sole component: Narrowing the digital gap in teaching (US$43,500,000).** This component will finance the following outputs: (i) rural schools connected, (ii) technology kits delivered, (iii) technological equipment for teachers delivered, and (iv) computer labs upgraded.

1.31 Output (i) relates to the installation of connectivity links in 2,400 schools, using optical fiber, carrier-sense multiple access (CSMA), or other superior technology. Financing will also be provided for the first few months of internet service, until such time as internet costs are transferred to MINEDUC's current expenditure budget. To ensure program sustainability, connectivity services will be established through direct contracting with the state-owned telecommunications company Corporación Nacional de Telecomunicaciones (CNT) (Annex III). Output (ii) consists of the procurement of portable kits that include a laptop, a projector, and loudspeakers, for use by teachers in the classroom. An estimated 2,940 kits will be procured for teachers in the schools connected through output (i).

1.32 Eligible schools for outputs (i) and (ii) will be central government schools that are located in rural areas and have no internet service.[13] Within this group of schools, priority will be given to those with one or two teachers, which serve students at the basic general education level. Connectivity will be established in the schools, which will also receive one technology kit for each teacher in order to expand access to

[13] The installation of connectivity links in schools located in urban areas may also be financed, provided that connectivity to rural schools has been completed or when it is impossible to justify financing the connectivity of rural schools.

digital resources and integrate these into teaching processes. To ensure that beneficiary students belonging to indigenous communities are included, it is estimated that 20% of beneficiary schools will be intercultural bilingual institutions, while 27% will be located in Amazon provinces.

1.33 Output (iii) refers to the purchase of laptops for use by 7,272 teachers in central government schools in both urban and rural areas.[14] Eligible teachers for output (iii) may be working in different levels of the education system (e.g., basic general or upper secondary education) and must be enrolled in MINEDUC programs for (a) strengthening students' academic skills, such as the extended school day program (which offers extracurricular academic activities to pupils); or (b) teacher professional development, such as continuous training (e.g., courses through Mecapacito platform) or advanced education programs (e.g., master's degrees under the Formar para Transformar investment project).[15] To strengthen the direct impact on students' education pathways, teachers from vulnerable schools participating in academic strengthening programs will be prioritized over those participating in professional development initiatives. To access devices, eligible teachers must apply through a process to be developed by MINEDUC. Where teacher demand exceeds the supply of equipment, MINEDUC will refer to these prioritization criteria and, where necessary, allocate equipment randomly to applicants.

1.34 Output (iv) consists of the procurement of technological equipment for computer labs (e.g., computers, projectors, and loudspeakers) and the refurbishment of existing spaces (paint, lighting, etc.). These activities are expected to benefit 632 central government schools belonging to different levels of the education system (e.g., basic general and upper secondary education) in urban areas. This output does not include any works.

1.35 The schools eligible for computer lab upgrading under output (iv) must have connectivity and must meet one of the following conditions: (a) physical space must be available for an information technology (IT) laboratory, but the school has no IT equipment; or (b) an IT laboratory exists but has suffered damage or losses and requires refurbishment. Priority will be given to schools that have a greater number of students and are participating in MINEDUC programs to strengthen the academic skills of students. As in the case of output (iii), should school demand for the installation or upgrading of laboratories exceed the supply of equipment, MINEDUC will refer to these prioritization criteria and, where necessary, select schools randomly.

1.36 **Administration, audit, and evaluation (US$1,500,000).** Administration, management, and supervision costs are included, together with external audits and the midterm and final evaluations for the operation.

C. Key results indicators

1.37 The program's general impact will be measured through indicators relating to the education pathways of students in Ecuador: (i) gross basic general education enrollment rates in rural areas; (ii) average mathematics scores of students in the 10th grade of basic general education; (iii) average language and literature scores

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[14] Teachers benefiting from output (ii) may not be considered for output (iii).

[15] These types of training are required for teachers to move up the salary grade scale.

of students in the 10th grade of basic general education; and (iv) gross upper secondary enrollment rates.[16]

1.38 The following key results indicators will also be monitored with respect to the promotion of more effective teaching processes: (a) use of the technological equipment purchased under the program; (b) level of adoption by teachers of educational technology for teaching purposes in rural and urban schools; (c) level of digital citizenship skills among teachers in rural and urban schools; (d) number of teachers who have completed at least one new training course; (e) number of students who have benefited from the program; and (f) number of students in intercultural bilingual schools that have benefited from the program.

1.39 Outcomes (a), (e), and (f) are associated with all of the outputs under the program. Outcomes (b) and (c) are linked to outputs (i), (ii), and (iv), under which the interventions focus on improving teaching practices. These outcome indicators capture innovative teaching practices such as personalized learning and timely formative assessments of students. Lastly, outcome (d) is associated with outputs (i), (ii), and (iii), which assign a device to each teacher, thus expanding access to training courses.

1.40 The Results Matrix indicators are set out in Annex II, while the methodology for measuring the impact of the program on these indicators is described in the monitoring and evaluation plan. Achieving these outcomes will require coordination between program actions and Digital Agenda for Education initiatives, particularly those relating to educational resources and teacher training.

1.41 **Cost-benefit analysis.** An economic analysis, performed using the cost-benefit methodology, yielded a positive net present value of US$139.14 million based on a measurement period of 42 years. The internal rate of return is 23.5%, which is above the 12% discount rate that represents the program's opportunity cost. This result is based on conservative assumptions regarding the impact of the intervention on the future wage earnings of the beneficiary population. The program's economic viability was confirmed under all scenarios in the sensitivity analysis, with impact indicator I.2 of the Results Matrix proving most sensitive to changes in the assumptions.

1.42 **Beneficiaries and users.** The program's users will be teachers, who will enjoy greater access to connected schools and technological equipment. The program will benefit students in central government schools in rural and urban areas at the basic general education and upper secondary levels. Outputs (i) and (ii) are expected to benefit approximately 48,743 students by providing connectivity and technology kits to central government basic education schools in rural areas. Of this total, an estimated 9,800 students attend intercultural bilingual schools, and beneficiary students in schools in the Amazon provinces will be monitored. In addition, output (iii) will benefit around 175,493 students in urban and rural central government schools at the basic general education and upper secondary levels, where teachers will receive technological equipment for purposes of teaching and professional development. Lastly, output (iv) will benefit around 641,817 students attending urban central

[16] Indicators (i) and (iv) are included in the National Development Plan 2021-25.

government schools at the basic general education and upper secondary levels, where computer labs will be provided.

II. Financing Structure and Main Risks

A. Financing instruments

2.1 The Government of Ecuador has requested a specific investment loan from the Bank in the amount of US$45 million. The borrower will be the Republic of Ecuador and the executing agency will be MINEDUC. This instrument is considered appropriate as the scope of the operation is fully defined, with components that cannot be divided without affecting their coherence. The program is also temporary, given that it responds to the immediate need of the MINEDUC to support the Education Sector Plan 2021-2025, and the Digital Agenda for Education more specifically.

2.2 The projected disbursement period is four years, and there will be no local counterpart funding. From a financial point of view, the four-year execution period takes into account the projected budget allocations for the investment project that this program is based on (paragraph 1.17). From a technical standpoint, the plan considers execution capacity (e.g., time frames for installing the fiber-optic cable) and support for the onboarding processes aimed at encouraging the use of the digital infrastructure.

Table 1. Estimated program costs (US$)[17]

Components	IDB	%
Single component. Narrowing the digital gap in teaching	43,500,000	96.7
P.1 Rural schools connected	17,000,000	37.8
P.2 Technology kits delivered	5,500,000	12.2
P.3 Technological equipment for teachers delivered	8,000,000	17.8
P.4 Computer labs upgraded	13,000,000	28.9
Administration, audit, and evaluation	1,500,000	3.3
Total	**45,000,000**	**100**

Table 2. Tentative disbursement schedule (US$)

Source of financing	Year 1	Year 2	Year 3	Year 4	End of project
IDB	5,895,110	20,133,667	12,418,667	6,552,556	45,000,000
Annual percentage	13	45	28	14	100

B. Environmental and social risks

2.3 Pursuant to the Bank's Environmental and Social Policy Framework, this project has been classified as a Category "C" operation, as potentially negative socioenvironmental impacts are expected to be minimal or nonexistent. Environmental and Social Performance Standards 1, 2, and 10 have been triggered,

[17] The amounts indicated within each component are indicative.

and actions will be included during the design of the project, as set out in optional link 3.

C. Fiduciary risks

2.4 Two high risks have been identified in the economic and financial environment, relating to budget allocations for the program. First, if the budget funding allocated by the Ministry of Economy and Finance (MEF) does not cover the amount requested by MINEDUC for financing of the planned annual activities, then physical and financial targets cannot be met. This will affect the achievement of specific development objectives, raising the possibility of extensions to the period for final program disbursement. Second, where budget allocations are sufficient, if the MEF fails to issue budget certifications sufficiently quickly for the process initiation resolution, then annual physical and financial targets for procurement transactions and payments will not be met. This will affect the achievement of specific development objectives, raising the possibility of extensions to the period for final program disbursement.

2.5 The following measures are proposed to mitigate these risks: (a) the program coordination team will bring forward precontractual activities; (b) semiannual portfolio reviews will be conducted; and (c) the Bank's team will accompany the executing agency to high-level meetings between MINEDUC and the MEF in order to remove bottlenecks and ensure streamlined execution.

D. Other key issues and risks

2.6 Two other medium-high risks have been identified: (i) human resources, as weaknesses due to a lack of experience on the part of MINEDUC units linked to the program could lead to delays in reviewing processes and issuing the enabling documents for launching procurement processes, and (ii) the political environment, as changes at the level of the maximum authority due to the current political situation could create weaknesses in institutional processes, affecting the launch of the program and the execution of planned activities. The following measures will be implemented to mitigate these risks: (a) implementing a training plan to strengthen MINEDUC's technical and management teams and contracting specific support consultancies to assist with program execution; and (b) in the event of changes in the government, holding onboarding meetings on the program for new officials and maintaining close communication with the counterpart regarding progress under the operation. With respect to risk (ii), two factors should be noted that contribute to the program’s sustainability despite the political instability: digital education is among the priorities of the presidential candidates and the investment project, “Reducing the Digital Gap in the National Education System,” associated with this loan has been deemed a priority beyond the change of government.

2.7 **Sustainability.** The following features of the program are related to the sustainability of its benefits: (i) all of the outputs are expected to enhance teachers' digital skills and foster a cultural change in the use of technology in Ecuador's schools, and this will have a long-term effect on teaching practices; (ii) use of the services of the state-owned Corporación Nacional de Telecomunicaciones (CNT) (see Annex III) to establish connectivity in rural schools (output 1) will facilitate the incorporation of post-installation internet operating costs into existing current expenditure contracts between MINEDUC and CNT, and this will ensure the sustainability of internet

services after program activities have been completed (paragraph 3.6); (iii) contracts for the devices (outputs 2, 3, and 4) will include periodic preventive and corrective maintenance clauses covering the useful life of the goods,[18] as stipulated in Ecuador's national procurement rules; (iv) MINEDUC will insure against robbery, theft, and/or damage of the equipment through its own general insurance policy; and (v) MINEDUC will use its own funds to replace equipment once it reaches the end of its useful life.

III. Implementation and Management Plan

A. Summary of implementation arrangements

3.1 **Borrower and executing agency.** The borrower will be the Republic of Ecuador and the executing agency will be MINEDUC. General program coordination will be the responsibility of the National Information and Communications Technology Division (DNTIC) in MINEDUC's Strategic Management Department. The executing agency will create a coordination team to determine the technical parameters for program processes and contract monitoring, supported by key staff members in the financial management, legal, planning and monitoring, and procurement areas. This team will be responsible for ensuring that program activities are coordinated with Digital Agenda for Education initiatives and the corresponding parts of MINEDUC that are involved in the Agenda, as follows: the Strategic Management Department, Educational Innovation and Well-Being Division, Educational Professional Development Division, Administrative and Financial Department, Planning Department, and Legal Advisory Department.

3.2 **Program Operating Regulations.** The program Operating Regulations establish operational guidelines and procedures in the following areas: (i) organizational arrangements for the program and the responsibilities of the executing agency, including those of the technical coordination team and the key support staff; (ii) coordination between program actions and Digital Agenda for Education initiatives, particularly those relating to educational resources and teacher training; (iii) MINEDUC must have the technological and pedagogical onboarding plan for the digital infrastructure before equipment purchase processes begin (as indicated in paragraph 1.20, MINEDUC will finance the preparation and implementation of this plan with its own funds); (iv) the responsibilities of other entities relating to program implementation; (v) technical and operational arrangements for executing outputs; (vi) arrangements for the implementation of program monitoring and evaluation activities; (vii) planning and programming procedures for the activities to be financed; (viii) program environmental and social management procedures; and (ix) guidelines for financial, audit, and procurement processes.

3.3 **Special contractual conditions precedent to the first disbursement of the loan. The borrower, through the executing agency, will provide evidence that (i) the program Operating Regulations have entered into force, in accordance with the terms previously agreed with the Bank; and (ii) the technical coordination**

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[18] The useful life of the equipment has been set at three years. Maintenance responsibilities will be assumed thereafter by each local district, with technical support provided by officials in the area of information and communication technologies.

team has been created with key support staff, including a financial management specialist, a legal specialist, a planning and monitoring specialist, and a procurement specialist. These conditions will ensure that appropriate operating processes and procedures are in place from the time execution begins.

3.4 **Special contractual conditions for execution.** Prior to the first bidding process for the purchase of the devices described in paragraph 1.30, MINEDUC will submit evidence to the Bank that it has an onboarding plan for the digital infrastructure (paragraph 1.20). This condition will promote the effective use of the digital infrastructure among teachers benefitting from the program.

3.5 **Procurement.** MINEDUC will carry out the procurement of goods, works, services, and consulting assignments in accordance with the Policies for the Procurement of Goods and Works Financed by the Bank (document GN-2349-15), the Policies for the Selection and Contracting of Consultants Financed by the Bank (document GN-2350-15), and all other internal Bank procedures. The procurement plan will cover four years of program execution from the date of eligibility, and it will be updated annually or as necessary in accordance with the execution and monitoring system established by the Bank. Pursuant to document GN-2680-2 approved by the IDB Board of Executive Directors, the use of country systems will apply to Bank-financed procurement once implementation of the agreement currently being prepared between the Republic of Ecuador and the Bank begins.

3.6 **Direct contracting with CNT.** Direct contracting with CNT is proposed for the installation of connectivity in rural schools, up to a maximum amount of US$17 million. To this end, MINEDUC has confirmed to the Bank that CNT is eligible as a state-owned enterprise to provide these services, pursuant to the provisions of paragraph 1.10(d) of policy document GN-2349-15. Direct contracting is justified under the circumstances established in paragraph 3.7(e) of policy document GN-2349-15, with three factors contributing to the exceptional nature of this case: (i) the need to ensure program sustainability, as a contract with CNT will allow MINEDUC to maintain internet services in program schools over the long term;[19] (ii) the efficient use of time and financial resources, given the ability of CNT to reduce costs and time frames by using the existing infrastructure of state-owned electricity companies to lay fiber-optic cable; and (iii) the need to minimize project-related environmental and social risks, as CNT will not need to build any new infrastructure in order to install connectivity, thus significantly reducing any environmental and social impact that might be caused by these types of works. These three considerations are consistent with the principles of value for money, economy, and efficiency. Values have been placed on the risks and the sustainability attribute, and an analysis has been performed of the effective, efficient, and economic use of financial resources and time. Contracting CNT will not compromise the quality of connectivity services, as the company has a latest-generation access network (*Asymmetric Digital Subscriber Line – Version 2* (ADSL2+) and optical fiber)

[19] CNT currently provides internet services to all central government schools, and national regulations establish that MINEDUC may not have two contracts for the same service.

and the most extensive coverage in the country; it also has good experience in providing internet services to MINEDUC.[20]

3.7 **Disbursements.** A special U.S. dollar bank account will be opened in the name of the project in the Central Bank of Ecuador, for the receipt of advances of funds and reimbursements. The Bank will provide advances of funds based on the program's liquidity needs over a maximum period of six months, while MINEDUC will prepare disbursement requests and provide supporting documentation pursuant to the provisions of the Financial Management Guidelines for IDB-Financed Projects (document OP-273-12). With the exception of the first advance of funds, documentation must be provided for at least 80% of the cumulative balance pending justification.

3.8 **Audit.** Project financial statements and expenditure eligibility will be audited by an independent external audit firm acceptable to the Bank and contracted by MINEDUC. Audit costs will be financed with project resources. Throughout the original disbursement period and any extension thereof, the program's audited financial statements will be submitted to the Bank within 120 days following the end of the executing agency's fiscal year. The audited financial statement will be presented within 120 days following the final disbursement date.

B. Summary of arrangements for monitoring results

3.9 **Monitoring arrangements.** MINEDUC will be responsible for monitoring each component and consolidating information for submission to the Bank every six months. The data needed to monitor progress toward outputs and outcomes will be collected according to the stipulations of the monitoring and evaluation plan. Progress under the program will be monitored based on the Results Matrix (Annex II), the multiyear execution plan and annual work plans, the procurement plan, financial plans, audited financial statements, and semiannual progress monitoring reports. To facilitate monitoring, the Education Division, in collaboration with the Bank's Country Office in Ecuador, will undertake regular field visits and meetings with the team in order to discuss the needs arising from these reports.

3.10 **Arrangements for evaluating results.** The impact of program interventions will be evaluated using quasi-experimental methodologies (with comparable control groups) and pre-post measurements without a control group. The following three outcome indicators will be measured using propensity score matching with a control group: (i) the level of adoption by teachers of educational technology for teaching purposes; (ii) the level of digital citizenship skills among teachers; and (iii) the number of teachers completing training courses. The remaining indicators in the Results Matrix will be evaluated without control groups, using primary and administrative data collected through the Edutech Guide, a tool that evaluates levels of educational technology adoption by teachers (see optional link 2).

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[20] A sample of events recorded in 2023 shows that only 0.5% of the central government schools served by CNT experienced an incident that affected the availability of network connectivity. In the vast majority of cases, connectivity availability was 100%, with a service quality factor of 1.0 (the maximum score).

Development Effectiveness Matrix		
Summary	EC-L1282	
I. Corporate and Country Priorities		
Section 1. IDB Group Strategic Priorities and CRF Indicators		
Development Challenges & Cross-cutting Issues	-Social Inclusion and Equality -Productivity and Innovation -Gender Equality and Diversity -Climate Change	
CRF Level 2 Indicators: IDB Group Contributions to Development Results	-Students benefited by education projects (#)	
2. Country Development Objectives		
Country Strategy Results Matrix	GN-3103-1	Expand the coverage and quality of physical and technological infrastructure; Expand access to and improve coverage of basic and social services.
Country Program Results Matrix	GN-3154-1	The intervention is included in the 2023 Operational Program.
Relevance of this project to country development challenges (If not aligned to country strategy or country program)		
II. Development Outcomes - Evaluability		Evaluable
3. Evidence-based Assessment & Solution		8.3
3.1 Program Diagnosis		1.8
3.2 Proposed Interventions or Solutions		3.5
3.3 Results Matrix Quality		3.0
4. Ex ante Economic Analysis		7.5
4.1 Program has an ERR/NPV, or key outcomes identified for CEA		1.5
4.2 Identified and Quantified Benefits and Costs		3.0
4.3 Reasonable Assumptions		0.0
4.4 Sensitivity Analysis		2.0
4.5 Consistency with results matrix		1.0
5. Monitoring and Evaluation		8.9
5.1 Monitoring Mechanisms		4.0
5.2 Evaluation Plan		4.9
III. Risks & Mitigation Monitoring Matrix		
Overall risks rate = magnitude of risks*likelihood		Medium Low
Environmental & social risk classification		C
IV. IDB´s Role - Additionality		
The project relies on the use of country systems		
Fiduciary (VPC/FMP Criteria)	Yes	Financial Management: Budget, Treasury, Accounting and Reporting. Procurement: Information System, Price Comparison, National Public Bidding.
Non-Fiduciary	Yes	Strategic Planning National System, Monitoring and Evaluation National System.
The IDB's involvement promotes additional improvements of the intended beneficiaries and/or public sector entity in the following dimensions:		
Additional (to project preparation) technical assistance was provided to the public sector entity prior to approval to increase the likelihood of success of the project		

Evaluability Assessment Note:

The general objective is to promote successful educational trajectories among students in Ecuador. To achieve this objective, the proposal focuses on promoting more effective teaching processes. The proposal diagnoses difficulties in school progression. On the one hand, the gross enrollment rate for Basic General Education in rural areas is 62%, compared to 109% in urban areas (MINEDUC, 2022). On the other hand, 57% of students in 10th grade do not reach the minimum level of learning expected for the grade in mathematics (Ser Estudiante, 2022).

The project identifies family community factors that are beyond the control of school processes as primary determinants of slow school progression. However, the project does not identify other initiatives that address this reality, nor does it propose actions, and points are deducted. The second critical aspect identified in the diagnosis is the weak effectiveness of the teaching processes. Identification of the determinants is based on multiple sources such as Grossman et al. (2013), Garrett and Steinberg (2015), and Stipek and Chiatovich (2017). Regarding the effectiveness of teaching, the diagnosis is based on the study by Calle-Suáres and Quichimbo-Rosas (2021) who find that most teachers apply classes based on memorization and repetition and there is no individualization of the teaching. instruction with a view to promoting critical thinking. The project then proposes to provide connectivity to rural schools, as well as computer equipment. This infrastructure crucially complements the teacher training and digital resources provided by the program called "Digital gap reduction in the National Education System". The program seeks that through online teacher training and the use of technology inside and outside the classroom, content and pedagogical practices can be improved and diversified, thus promoting better learning and school progression. The proposal cites evidence of effectiveness for similar initiatives by Ganimian et al. (2020), Arias Ortiz et al, (2020); Opertti (2021), Wilichowski et al. (2021).

The economic analysis estimates a Net Present Value of US$139 million and an internal rate of return of 23.5%. The benefits are derived from the expected returns to the education of the benefited students. The benefit assumption in the analysis are congruent with the numbers listed in the results matrix. The costs include the amount of the project and does not assume costs on complementary inputs provided by the digital divide reduction project. The project includes a sensitivity analysis that finds the returns are maintained to scenarios including extensions in execution or learning achievement in smaller magnitude than expected.

The monitoring is based on information collected by the monitoring software on the use of technological equipment, the "Guía Edutec" Survey, and administrative data. Since the information on teacher mastery of digital resources is self-reported, points are deducted. The evaluation of the indicators associated with the specific objectives proposes a matching methodology.

RESULTS MATRIX

Project objective:	The specific objective is to encourage more effective teaching processes. Achieving this objective will support the general objective of promoting successful education pathways for Ecuador's students.

GENERAL DEVELOPMENT OBJECTIVE

Indicators	Unit of measure	Baseline amount	Baseline year	Target year	Target	Means of verification	Comments
General development objective: Promoting successful education pathways for Ecuador's students[1,2]							
(I.1) Gross basic general education enrollment rate in rural areas.	%	64.07%[3]	2023	2027	64.87%	Administrative records, MINEDUC/National Statistics and Census Institute (INEC)	See monitoring and evaluation plan.
(I.2) Gross upper secondary enrollment rate.	%	88.40%[4]	2023	2027	89.77%	Administrative records, MINEDUC/National Statistics and Census Institute (INEC)	See monitoring and evaluation plan.
(I.3) Average national mathematics scores in the 10th grade of basic general education.	Average	693.24	2022	2027	695.83	"Ser estudiante" tests, Instituto Nacional de Evaluación Educativa	See monitoring and evaluation plan.[5]
(I.4) Average national language and literature scores in the 10th grade of basic general education.	Average	682.05	2022	2027	686.36	"Ser estudiante" tests, Instituto Nacional de Evaluación Educativa	See monitoring and evaluation plan.

1 Promoting successful education pathways refers to an increase in enrollment rates and an improvement in students' academic performance.

2 Targets I.1 and I.2 are based on the projections included in the National Development Plan 2021-2025. In addition, the targets take into account the slowing rate of growth, influenced by the negative impacts of COVID on schooling (Abizanda et al., 2021).

3 The baseline figure corresponds to the projected figure in the National Development Plan 2021-2025. It will be updated once the official statistics for 2023 have been published (in the first quarter of 2024).

4 Idem.

5 Good scores in basic general education are supportive of enrollment and advancement in subsequent grades, lowering the probability of dropping out of the school system (Alexander et al., 2001; Román, 2013).

SPECIFIC DEVELOPMENT OBJECTIVES

Indicators	Unit of measure	Baseline amount	Baseline year	Year 1	Year 2	Year 3	Year 4	Project completion	Means of verification	Comments
Specific development objective: Encourage more effective teaching processes[6]										
(R.1) Average number of hours spent using technological equipment each month.	Hours	0	2023	10	10	15	15	15	Software for monitoring the use of the technological equipment, MINEDUC	Applies to all beneficiary schools, which are central government basic general education and upper secondary schools in rural and urban areas. See monitoring and evaluation plan.
(R.2) Proportion of teachers in rural schools who have attained at least the "familiarization" level with respect to the adoption of educational technology for teaching purposes.[7]	[Teachers / Teachers]	TBD[8]	2024	-	-	-	-	+5%[9]	Edutech Guide survey, MINEDUC	Applies to teachers targeted under outputs 1 and 2, who belong to central government basic general education schools in rural areas. The target is expressed in terms of percentage points over the baseline figure. See monitoring and evaluation plan.

6 Effective teaching processes are supported by innovative pedagogical practices and properly trained teachers. These elements are reflected in (a) the indicators in the Edutech Guide to adopting technology for teaching purposes (R.2 y R.3), which measure innovative teaching strategies such as personalized learning and timely formative assessments of students (see annex to the monitoring and evaluation plan); (b) the indicators in the Edutech Guide relating to digital citizenship (R.4 y R.5), which capture the use of critical thinking in teaching processes; and (c) an indicator relating to teacher training (R.6).

7 The Edutech Guide divides teachers' levels of technology adoption in educational processes into five categories: exposure, familiarization, adaptation, integration, and transformation. Teachers at the familiarization level have begun to learn about technology and use it intermittently in their activities. They also identify and view technology as a support for their teaching work. The use of technology focuses on teachers.

8 The Ministry of Education plans to adjust the Edutech Guide survey and pilot its use in 2023, before launching annual data-gathering exercises in 2024. The baseline will be updated using the results of the Edutech Guide exercise in 2024. The program will support implementation of this exercise, and funds will be available for processing the data and evaluating impact.

9 Initial results from the application of the Edutech Guide in other education systems in the region were used as a benchmark.

Indicators	Unit of measure	Baseline amount	Baseline year	Year 1	Year 2	Year 3	Year 4	Project completion	Means of verification	Comments
(R.3) Proportion of teachers in urban schools who have attained at least the "familiarization" level with respect to the adoption of educational technology for teaching purposes.	[Teachers / Teachers]	TBD	2024	-	-	-	-	+10%[7]	Edutech Guide survey, MINEDUC	Applies to teachers targeted under output 4, who belong to central government basic general education and upper secondary schools in urban areas. See monitoring and evaluation plan.
(R.4) Proportion of teachers in rural schools that have attained at least the "familiarization" level with respect to digital citizenship.	[Teachers / Teachers]	TBD	2024	-	-	-	-	+5%[7]	Edutech Guide survey, MINEDUC	Applies to teachers targeted under outputs 1 and 2, who belong to central government basic general education schools in rural areas. See monitoring and evaluation plan.
(R.5) Proportion of teachers in urban schools that have attained at least the "familiarization" level with respect to digital citizenship.	[Teachers / Teachers]	TBD	2024	-	-	-	-	+10%[7]	Edutech Guide survey, MINEDUC	Applies to teachers targeted under output 4, who belong to central government basic general education and upper secondary schools in urban areas. See monitoring and evaluation plan.
(R.6) Teachers who are program beneficiaries and have completed at least one new training course.	Teachers	0	2023	565	1,610	954	445	3,574	Report, National Department of Continuous Training, MINEDUC	Applies to teachers targeted under outputs 1, 2, and 3, who belong to central government basic general education and upper secondary schools in urban and rural areas. See monitoring and evaluation plan.
(R.7) Students benefiting from the greater use of technology and trained teachers who are at the "familiarization" level with respect to digital citizenship and the adoption of educational technology for teaching purposes.	Students	0	2023	34,287	334,404	263,558	233,803	866,052	MINEDUC administrative data	Applies to students in basic general and upper secondary education in urban and rural central government schools. See monitoring and evaluation plan. Associated with outcomes 1 to 6.

Indicators	Unit of measure	Baseline amount	Baseline year	Year 1	Year 2	Year 3	Year 4	Project completion	Means of verification	Comments
(R.8) Students in intercultural bilingual schools benefiting from the greater use of technology and trained teachers who are at the "familiarization" level with respect to digital citizenship and the adoption of educational technology for teaching purposes.	Students in intercultural bilingual schools	0	2023	2,040	5,300	2,460	-	9,800	MINEDUC administrative data	Applies to students in basic general education at central government intercultural bilingual schools. See monitoring and evaluation plan. Associated with outcomes 1, 2, 4, and 6.

OUTPUTS

Indicators	Unit of measure	Baseline amount	Baseline year	Year 1	Year 2	Year 3	Year 4	Project completion	Means of verification	Comments
Single Component: Narrowing the digital gap in teaching										
(P.1) Rural schools connected.	Schools	0	2023	500	1,300	600	-	2,400	Semiannual progress report, MINEDUC	See monitoring and evaluation plan. The school is considered to be connected when the equipment is first used to remotely connect to the school's IP address. This output contributes to outcomes 2 and 4.
Milestone 1: Rural intercultural bilingual schools connected.	Schools	0	2023	102	265	123	-	490		
Milestone 2: Rural schools in the Amazon region connected.	Schools	0	2023	135	352	163	-	650		
(P.2) Technology kits delivered.	Kits	0	2023	615	1,600	725	-	2,940	Semiannual progress report, MINEDUC	The kits consist of a laptop, projector, and loudspeaker. Minimum technical specifications for the devices are included in the Project to Reduce the Digital Gap in the National Education System, (pages 98-111). Teachers will provide a signature to confirm delivery. This output contributes to outcomes 1, 2, and 4.
Milestone 1: Technology kits delivered in rural intercultural bilingual schools.	Kits	0	2023	154	400	181	-	735		
Milestone 2: Technology kits delivered in rural schools in the Amazon region.	Kits	0	2023	204	531	240	-	975		
(P.3) Technological equipment for teachers delivered.	Units of equipment	0	2023	1,000	3,000	2,000	1,272	7,272	Semiannual progress report, MINEDUC	Minimum technical specifications for the devices are included in the Project to Reduce the Digital Gap in the National Education System, (pages 98--111). Teachers will provide a signature to confirm delivery. This output contributes to outcomes 1 and 6.

Indicators	Unit of measure	Baseline amount	Baseline year	Year 1	Year 2	Year 3	Year 4	Project completion	Means of verification	Comments
(P.4) Computer labs upgraded.	Laboratories	0	2024	0	232	200	200	632	Semiannual progress report, MINEDUC	A laboratory encompasses computer equipment, furniture, painting, and lighting. Minimum technical specifications for the devices are included in the Project to Reduce the Digital Gap in the National Education System, (pages 98-111). This output contributes to outcome 1.

Country: Ecuador **Division:** EDU **Operation:** EC-L1282 **Year:** 2023

FIDUCIARY AGREEMENTS AND REQUIREMENTS

Executing agency: The borrower, through the Ministry of Education (MINEDUC)

Operation name: Reduction of the Digital Divide in Education in Ecuador

I. FIDUCIARY CONTEXT OF THE EXECUTING AGENCY

1. Use of country systems in the operation[1]

☒ Budget	☒ Reporting	☒ Information systems	☐ National Competitive Bidding (NCB)
☒ Treasury	☐ Internal audit	☐ Shopping	☐ Other
☒ Accounting	☐ External control	☐ Individual consultants	

2. Fiduciary execution mechanism

☒	Special features of fiduciary execution	This operation is a specific investment loan for US$45 million. The instrument is warranted as the scope of the program is temporary, given that it responds to MINEDUC's immediate need to support the Education Sector Plan 2021-2025 and the Digital Agenda for Education. The projected disbursement period is four years, and there will be no local counterpart funding. The borrower will be the Republic of Ecuador and the executing agency will be MINEDUC.

3. Fiduciary capacity

Fiduciary capacity of the executing agency	The risk workshop identified the following issues: (i) potential fiscal allocation constraints in the national budget due to the ceilings set by the Ministry of Economy and Finance (MEF)—if payments are not made by the MEF in a timely manner, payments to suppliers and contractors may be delayed, affecting program objectives; and (ii) the volume and type of procurement contracts planned under the program are significant and complex—MINEDUC's lack of familiarity with executing IDB-financed projects could lead to errors in applying policies and procedures during execution, creating delays in the planned timeline.

[1] Any system or subsystem that is subsequently approved may be applicable to the operation, in accordance with the terms of validation by the Bank.

4. Fiduciary risks and risk response

Risk classification	Risk	Risk level	Risk response
Economic and financial	If the budget funding allocated by the MEF does not cover the amount requested by MINEDUC for financing of the planned annual activities, then physical and financial targets will not be met. This will affect the achievement of specific development objectives, raising the possibility of extensions to the period for final program disbursement.	High	▪ Develop precise financial plans so as to avoid rejection of the annual budget request or the cancellation of appropriations due to a failure to execute; ▪ Inform the MEF at an early stage of budget requirements and effective commitments of funds under the project. ▪ In portfolio reviews with the Bank and the MEF, include historical information on deviations in execution due to a lack of budget appropriations for projects executed by MINEDUC.
Economic and financial	Where budget allocations are sufficient, if the MEF fails to issue budget certifications sufficiently quickly for the process initiation resolution, then annual physical and financial targets for procurement transactions and payments will not be met. This will affect the achievement of specific development objectives, raising the possibility of extensions to the period for final program disbursement.	High	▪ Arrange multiyear certifications for contracts where necessary. ▪ Notify the MEF at an early stage of adjudication processes and contractual commitments and the status of each one. ▪ Hold high-level meetings between MEF and MINEDUC officials to communicate program progress and requirements. ▪ In portfolio reviews with the Bank and the MEF, include historical information on deviations in execution due to delays in providing certifications for projects executed by MINEDUC.

Human resources	Weaknesses due to a lack of experience on the part of MINEDUC units (legal, procurement, and financial management) linked to the program could lead to delays in reviewing processes and issuing the enabling documents for launching procurement and payment processes and administering planned contracts. This would lead to a failure to meet programmed physical and financial targets, affecting attainment of the program's specific development objectives.	Medium-high	▪ Immediately arrange a training plan with MINEDUC, including the teams in both procurement clinics and fiduciary management onboarding events. ▪ Identify funds for strengthening MINEDUC and the project management team through the use of support consultants. ▪ In the program Operating Regulations, include full details of the activities, powers, responsibilities, and authorizations of each of the units linked to the program.

5. Policies and guidelines applicable to the operation: Documents GN-2349-15, GN-2350-15, and OP-273-12.
6. Exceptions to policies and guidelines: None.

II. CONSIDERATIONS FOR THE SPECIAL PROVISIONS OF THE LOAN CONTRACT

Special conditions precedent to first disbursement: The borrower, through the executing agency, will provide evidence that (i) the program Operating Regulations have entered into force, in accordance with the terms previously agreed with the Bank; and (ii) the technical coordination team has been created with key support staff, including a financial management specialist, a legal specialist, a planning and monitoring specialist, and a procurement specialist.
Exchange rate: For purposes of the activities stipulated in Article 4.10 of the general conditions, the Parties agree that the applicable exchange rate will be the one indicated in subparagraph (b)(ii) of said Article. Accordingly, the agreed exchange rate will be that prevailing on the effective date on which the borrower, executing agency, or any other natural or legal person to whom the authority to incur expenses has been delegated, makes the respective payments to a contractor, supplier, or beneficiary.
Type of audit: Throughout the original loan disbursement period and any extension thereof, and within 120 days after the end of its fiscal year and within 120 days of the last disbursement of the loan, MINEDUC will submit special purpose annual financial statements for the project, duly audited by an independent audit firm acceptable to the Bank. The auditors will also issue a report on their findings with regard to internal control (management letter). The independent audit firm will be hired at least 120 days prior to the end of each fiscal year or the date of final disbursement.

III. AGREEMENTS AND REQUIREMENTS FOR PROCUREMENT EXECUTION

☒	Bidding documents	The procurement of works, goods, and nonconsulting services subject to international competitive bidding under the Bank's procurement policies (document GN-2349-15) will be carried out using either the Standard Bidding Documents issued by the Bank or the bidding documents agreed between the executing agency and the Bank. The selection and contracting of consulting services will be carried out in accordance with the Policies for the Selection and Contracting of Consultants (document GN-2350-15) and will use either the Bank's Standard Request for Proposals document or the request for proposals agreed between the executing agency and the Bank. The review of technical specifications and terms of reference for contracts during preparation of the processes is the responsibility of the project sector specialist. This technical review may be carried out ex ante and is independent of the method of procurement review.
☒	Direct contracting and selection	The following direct contract has been identified as necessary for project implementation: Direct contracting with the state-owned telecommunication company Corporación Nacional de Telecomunicaciones (CNT) to provide fiber-optic connectivity services to rural schools in the 2024, 2025, and 2026 phases, for a total estimated maximum amount of US$17 million. Confirmation of eligibility: Policy document GN-2349-15, Section I, paragraph 1.10(d) stipulates the following: Government-owned enterprises in the Borrower's country may participate only if they can establish that they: (i) are legally and financially autonomous; (ii) operate under commercial law; and (iii) are not dependent agencies of the Borrower or Sub-Borrower. A legal analysis prepared by MINEDUC[2] confirms compliance with the three aforementioned requirements, and it has therefore been determined that CNT is eligible for contracting using IDB resources. Circumstances in which direct contracting is permitted: Policy document GN-2349-15, Section III, paragraph 3.7(e) stipulates the following: "in exceptional cases for example, in response to natural disasters, emergency situations, or where there is lack of providers/contractors for small and low risk procurement." A technical analysis prepared by the MINEDUC technical and sector team and the IDB[3] listed the reasons considered for direct contracting, as summarized below: For the provision of connectivity services under the IDB program, MINEDUC proposes the direct contracting of CNT based on exceptional circumstances. Three reasons were analyzed, together with their technical implications:

2 Legal opinion on the feasibility of contracting the state-owned enterprise CNT.

3 Technical evaluation of the potential contracting of CNT.

		1. Ensuring sustainability of the IDB program. Once connectivity infrastructure has been installed using the loan proceeds, MINEDUC will ensure the continuity of internet services in the targeted schools by adding them to an existing contract with the CNT financed by current expenditure. As the Act prohibits the subdivision of contracts (i.e., two companies simultaneously financing the same service), MINEDUC may not initiate a new internet services contract with a company other than CNT. For the project, it is essential that MINEDUC ensures the continuity of internet services in the targeted schools once connectivity has been installed. Without internet services, teachers will be unable to access digital resources and professional development opportunities to strengthen their teaching processes; this will compromise the attainment of the program's specific and general objectives. 2. Efficiency in the use of financial resources and time. As a public enterprise, CNT may conclude an interagency agreement with the public electricity company to use existing utility poles for the fiber-optic cable needed to install connectivity. Without such access, the companies would need to install new infrastructure, increasing service costs and installation times. Allocating more financial resources to providing connectivity due to the installation of new poles would lead to a reduction in the number of schools served and, therefore, a reduction in the number of students benefited, affecting the specific objectives of the program. In addition, new infrastructure (instead of using existing infrastructure) could lengthen the execution period for output 1 ("rural schools connected"), potentially leading to delays in the program that would in turn affect the timely achievement of the specific objectives. 3. Minimizing project-related environmental and social risks. The installation of new posts would not only lead to a rise in service costs but also an increase in environmental and social risks, as additional construction would be included in rural areas where populations are socially more vulnerable. No works are anticipated under the program as regards the installation of connectivity, as existing posts belonging to the public electricity companies will be used. In addition, pursuant to the Bank's Environment and Social Policy Framework, the loan has been classified as a Category "C" operation, as potentially negative socioenvironmental impacts are expected to be minimal or nonexistent. New infrastructure provided by other companies would increase the expected risks during program execution. CNT is considered to be an exceptional option within the provisions of policy document GN-2349-15, paragraph 3.7(e), and the proposal is consistent with the procurement principles of value for money, economy, and efficiency. The proposed contract heeds the aforementioned principles given that values have been placed on the risks and the sustainability attribute, and an analysis has been performed of the effective, efficient, and economic use of financial resources and time.

<table>
<tr><td>☒</td><td>Procurement supervision</td><td>Supervision will be conducted on an ex post basis, with the exception of those cases in which ex ante supervision is justified, as stipulated in the procurement plan. Where procurement processes are executed through the country system, supervision will be performed through the country supervision system. The supervision method will be determined for each selection process: (i) ex ante, (ii) ex post, or (iii) country system. Ex post reviews will be conducted every calendar year in accordance with the project supervision plan, subject to changes during the course of execution. The ex post review reports may include one on-site visit to inspect procurement processes subject to ex post review; these will be selected randomly and cover at least 10% of contracts. Ex post review thresholds are as follows:
<table>
<tr><th>Executing agency</th><th>Works</th><th>Goods and services</th><th>Consulting Services</th></tr>
<tr><td>MINEDUC</td><td>US$3 million</td><td>US$250,000</td><td>US$200,000</td></tr>
</table>
</td></tr>
<tr><td>☒</td><td>Records and files</td><td>MINEDUC will maintain order and integrity in the filing system, organizing files chronologically, independently, by process, and by source of financing.</td></tr>
</table>

Main procurement items

Item description	Selection method	Estimated date	Estimated amount (US$ thousands)
Goods			
Procurement of technology kits for teachers in rural schools – 2024 phase	International competitive bidding	07/05/2023	1,150
Procurement of technology kits for teachers in rural schools – 2025 Phase		07/04/2024	2,850
Procurement of technology kits for teachers in rural schools – 2026 Phase		07/04/2025	1,500
Procurement of notebooks for teachers – 2024 phase		07/05/2023	1,100
Procurement of notebooks for teachers – 2025 phase		07/04/2024	3,200
Procurement of notebooks for teachers – 2026 phase		07/04/2025	2.200
Procurement of notebooks for teachers – 2027 phase		07/04/2026	1,500
Procurement of equipment for computer labs – 2025 phase		07/04/2024	4,740

Item description	Selection method	Estimated date	Estimated amount (US$ thousands)
Procurement of equipment for computer labs – 2026 phase		07/04/2025	4,150
Procurement of equipment for computer labs – 2027 phase		07/04/2026	4,100
Nonconsulting services			
Contracting of CNT project team for the laying and installation of fiber-optic cable for connectivity in rural schools – 2024 phase	Direct contracting	06/30/2023	3,550
Contracting of CNT project team for the laying and installation of fiber-optic cable for connectivity in rural schools – 2025 phase		06/30/2024	9,200
Contracting of CNT project team for the laying and installation of fiber-optic cable for connectivity in rural schools – 2026 phase		06/30/2025	4,250
Firms			
4 contracts for the midterm evaluation, final evaluation, impact evaluation, and other program studies or evaluations	Quality- and Cost-Based Selection	10/01/2024	280
Annual external program audits and final program audit		10/01/2024	120
Clean technology procurement advisor and other support consultancies, various contracts	Consultant's Qualifications-Based Selection	10/01/2024	570
Individual consultants			
6 consultants to strengthen the project management team: project manager, financial specialist, procurement specialist, management assistant, environmental policy advisor, and monitoring and evaluation advisor	Selection of Individual Consultants (3 CVs)	01/01/2026	530

See link for procurement plan.

IV. AGREEMENTS AND REQUIREMENTS FOR FINANCIAL MANAGEMENT

☒	Programming and budget	The Planning and Public Finance Code (COPLAFIP) establishes the rules governing budget programming, formulation, approval, execution, control, evaluation, and settlement. MINEDUC is responsible for the processes needed to incorporate the corresponding budget items into its budget.
☒	Treasury and disbursement management	Disbursements will be made using the OD (online disbursement) electronic platform. Disbursements will be deposited in U.S. dollars in an exclusive account at the Central Bank of Ecuador, and will then be transferred on the same day to the Treasury Single Account, from which project-related payments will be made. Advances will be made for a period of up to 180 days, based on actual liquidity needs in accordance with MINEDUC's financial plan and itemized cash flow. For each advance of funds, at least 80% of previously advanced funds must be accounted for.
☒	Accounting, information systems, and reporting	Accounting will follow government accounting standards, which are converging with International Public Sector Accounting Standards. The U.S. dollar is the legal currency in Ecuador for both transactions and reporting. MINEDUC uses the e-SIGEF financial administration system, which integrates the following processes: budgeting (for executing expenditure), accounting (for recording transactions on an accruals basis), and treasury (for issuing payments to suppliers and contractors). The e-SIGEF is used to generate reports and is the foundation for preparing cash flow statements and cumulative investment statements on a cash basis, using information in the e-SIGEF and auxiliary reports in Excel.
☒	Internal control and audit	Ecuador's constitution identifies the Office of the Comptroller General (CGE) as the lead agency for the system of public sector controls. As part of this sector, MINEDUC has its own internal audit unit.
☒	External control and financial reports	MINEDUC, with the Bank's agreement, will select and contract the services of a Bank-eligible audit firm responsible for auditing the special-purpose financial statements in accordance with the Financial Management Guidelines for IDB-Financed Projects, the Instructions for Financial Reporting and External Audit Management, and the terms of reference previously agreed with the Bank. The cost of the external audit services may be financed using program resources.
☒	Financial supervision of the operation	Although MINEDUC has prior and ongoing experience with another loan operation, it will require additional strengthening in both financial management and the process of contracting and selecting of an audit firm for the program. Accordingly, financial supervision will be carried out by means of virtual/or in-person work meetings, reviews of the audited financial statements and internal control reports, and in response to ad hoc issues that require the Bank's support.