Taking Stock of IDB Lab´s Skills for the Future Projects 2016-2019

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Employability opportunities in the knowledge economy for youth living in vulnerable conditions in Latin America and the Caribbean

Despite considerable progress in the past two decades, youth in Latin America and the Caribbean continue to face substantial challenges in accessing quality education and increasing their participation in the labor market. According to the OECD (2017), more than 70% of youth in the region are not sufficiently skilled to access good quality jobs, and only 30% of youth ages 25-29 have attended tertiary education — college, university, or technical school — and are considered properly skilled to face the continuously changing demands of today's labor market. Furthermore, 31% of youth ages 15-29 — or 43 million young people — have not completed secondary education or are not enrolled in school[1] (ibid). The region is also facing its highest levels of youth unemployment in the past 30 years, with 10 million young people looking to enter the labor market but unable to find a job opportunity, particularly one that offers a decent employment path.[2] Additionally, 20% of young people in the same age bracket are not in employment, education, or training (NEET), and this situation is particularly exacerbated for women, who still face many obstacles to joining the labor market.[3]

The region is besieged by challenges, among them: a lack of quality in its educational systems; low rates of participation and completion of secondary and tertiary education; poor relevance of skills developed relative to the demands of the labor market; and the pervasive effects of informality in the employment opportunities afforded to youth.[4] In addition, the changing pace of technology and the economic, social, and cultural transformations deriving from it are putting additional skill demands on young people who are not properly equipped for the changing labor market. Powerful disruptive technologies, such as artificial intelligence (AI), robotics (automation), and digital job-training-related platforms (the gig economy), are evolving at an exponential pace and driving growth in critical sectors such as agriculture, manufacturing, finance, transportation, education, trade, retail, and information and communication technologies. Most critically, as these technologies become more accessible and affordable, they have the potential to impact growth, labor markets, and income distribution.[5]

This regional educational and employment outlook for youth threatens to impede badly needed economic growth, stifling innovation and perpetuating social and economic inequalities in a region with some of the highest income gaps in the world.

Latin American and Caribbean (LAC) countries have one of the largest skills gaps in the world, starting with the most basic skills that will set the foundation for the more sophisticated ones that will be in demand.[6]

- **Basic skills:** Only 30% of children in third and fourth grade in LAC countries meet the minimum benchmark for math proficiency, compared to 66% for nations with similar levels of development and 93% in developed nations.[7]
- **Technical skills, especially digital skills:** From 2010 to 2015, the region saw an increase (from 34% to 42%) in the share of employers reporting that an inadequately educated workforce posed a barrier to hiring.[8] In 42 countries,

the IT sector was among the top 10 in difficulty filling positions, and it was No. 8 overall in Latin America. By 2019, Latin America will have a shortage of almost half a million information technology professionals.[9] By 2025, Latin America will need 1.25 million software developers.[10]

- **Socio-emotional skills:** Eighty percent of employers in Argentina, Brazil, and Chile indicated that positive socio-emotional skills such as empathy, adaptability, and responsibility are the most difficult skills to find among workers.[11]

Digital technologies are changing the demand for skills. Companies are demanding 21st century skills, such as basic and more advanced digital skills, socio-emotional skills (problem solving, communications, critical thinking, creativity), and English. There is an increased demand for people who can fill jobs such as software developers, data scientists, and UX/UI designers.[12]

Technology is also disrupting the provision of education and training, which could help equip youth with more relevant skills. At the K-12 level, there is a high level of uncertainty, and educators have difficulty predicting exactly which skills or competencies will be needed in 10 or 15 years. But it is precisely in this context of uncertainty that education systems are trying to provide students with two types of skills: 1) technological skills such as computer science, coding, and data analysis, given that many will have to use technology to become more productive; and 2) the human skills that machines do not have — soft skills such as creativity, abstract thinking, and empathy. At the higher education level, there is a surge of massive open online courses (MOOCs); education platforms such as Coursera and EdX, on which students can learn on their own and acquire new skills at an affordable price;[13] and coding bootcamps that could provide an alternative to college degrees.[14] The development of more flexible learning paths will be essential to increasing the supply of micro-degrees and credentials and transition toward a society where lifelong learning is the norm and not the exception.

However, in **LAC countries, technology is being adopted at a slower pace than in developed economies, and this will mitigate the positive and adverse impacts of technology.** Several factors reduce incentives to capital investment in automation technology in LAC countries in comparison to the developed world: 1) lower labor costs; 2) different regulatory frameworks; and 3) a different skill base among the population. This can be illustrated by the density of robots,[15] which is lower in LAC countries than in other regions.[16] Some countries in the region, due to the presence of automated processes such as vehicle production and chemical and plastics, show a higher number of industrial robots relative to the number of manufacturing workers than other countries.

It is imperative to accelerate the adoption of technology, maximizing the opportunities that the Fourth Industrial Revolution brings to LAC countries, while reducing the costs of this transformation to people and society. Countries in different LAC subregions will face different situations. The effects of technology and demographic trends on how people work will vary by industry, geography, and demography. Each of these factors has distinct requirements, constraints, and potential to redefine the future of work.

The Role of IDB Lab as partner for the region, facing the Future of Work

The Multilateral Investment Fund (now known as IDB Lab), is the innovation laboratory of the IDB Group. The purpose of IDB Lab is to drive innovation for inclusion in the region by mobilizing financing, knowledge, and connections to co-create solutions capable of transforming the lives of vulnerable populations affected by economic, social, or environmental factors. Through a mix of different instruments and a higher tolerance for risk, IDB Lab has become the leading source of development finance and knowhow for improving lives in Latin America and the Caribbean. IDB Lab has three thematic areas: Climate-Smart Agriculture, Inclusive Cities, and Knowledge Economy. It also tackles cross-cutting topics such as poor and vulnerable populations, climate change, gender, and diversity. The increased focus on

tech-enabled innovations with disproportional impact for inclusion is expected to result in interventions that scale more rapidly and reach more people. Since 1993, IDB Lab has approved more than $2 billion USD in projects deployed across 26 LAC countries .

Experience with skills development. For decades, IDB Lab has built a robust portfolio on workforce development — pioneering skills standards and certification systems, for example — and over time it has emphasized equipping disadvantaged young people with the right set of employability and entrepreneurial skills for the labor market through flagship programs such as entra21, A Ganar, NEO and YEP.[18] With the addition of the Knowledge Economy pillar in 2016, the portfolio of projects that addresses youth employability and entrepreneurship has shifted its focus toward building a skilled workforce to compete and thrive in the knowledge economy. IDB Lab promotes projects that fall roughly into these categories: 1) projects that build coding and broader digital skills, socio-emotional skills, and STEM skills among schoolchildren, out-of-school vulnerable youth, and other underrepresented groups in the IT sector, such as women, migrants, and afro-descendants; 2) projects that use promising technologies or methodologies to modernize the delivery of training and increase learning; 3) projects that use tech-powered platforms to connect students with jobs or to guide students to knowledge economy jobs; 4) projects that link the private and public sectors to better align the workforce's supply and demand while building a stronger ecosystem for employability; 5) projects that use outcomes-based financing to improve results while focusing on vulnerable populations; and 6) projects that invest in early-stage edutech and platform-based companies.

Objectives and structure of the report

The primary objective of this report is to provide a categorization of a selected number of projects that were part of the IDB Lab Future of Work portfolio between 2016 and 2019, with one project from 2015 included for its valuable lessons about training young women. This categorization is based on the different training approaches and methodologies, primary target groups, the types of skills the projects seek to advance, and the variety of strategies designed to facilitate the transition of young people into the labor market or to continue their education.
In addition, the analysis assesses the progress of the projects from start date until June 2019, and identifies the main lessons learned related to project design, implementation, and sustainability in the years since their implementation. The combined analysis serves as the basis for the recommendations emerging from this study.

The analysis presented in the report covers 25 projects in total (See Figure 1) and it is based on an extensive review and coding of four main information sources:

1. The donors memorandum that provides a general description of the project, strategy plan, and performance indicators to measure progress;
2. The latest available project progress reports (PSRs submitted in December 2018 and June 2019, depending on the project);
3. Semi-structured interviews with IDB project coordinators and representatives from the executing agencies for six projects; and
4. Additional supporting material.

Structure of the Report

Chapter 1: Categorization of IDB Lab Future of Work projects

This chapter presents the categorization of the 25 projects according to the age of the projects, financial information, primary target groups, training approaches and methodologies, the types of skills their innovation seeks to advance, and the variety of strategies designed to facilitate the transition of young people into the labor market or to continue their education.

Chapter 2: Assessment of progress and lessons learned

This chapter analyzes the progress of the projects as of June 2019, drawing on the most prevalent quantitative and qualitative performance indicators. This chapter includes a discussion of the main potential risk factors and associated mitigation strategies that have affected or could affect the design, implementation, sustainability, and scalability of the projects. As part of this discussion, we identified some of the most relevant lessons learned in six key areas that could inform strategies for current projects and serve as a guide for future programmatic decisions by IDB Lab.

Chapter 3: Recommendations

This chapter offers a series of recommendations that could help guide future IDB Lab investments and also inform the strategies of projects that are currently in the portfolio.

Case Studies

The findings of an in-depth analysis of six projects that illustrate the different training approaches, types of skills developed, employability programs, and innovative strategies used to provide young people from vulnerable backgrounds better skill-development opportunities and paths to decent employment.

Figure 1: Distribution of projects included in the analysis

Categorization of the IDB Lab Future of Work Portfolio 2012- 2019

The chapter presents the categorization of the IDB Lab Future of Work project portfolio from 2016 to 2019, with the exception of one project that started in 2015 that was included because of its important lessons about working with young women in conditions of vulnerability. The projects were categorized according to their age, financial information, primary target groups, training approaches and methodologies, the types of skills their innovation seeks to advance, and the variety of strategies designed to facilitate the transition of young people into the labor market or to continue their education.

The categorization analysis covers a total of 25 projects of the IDB Lab Future of Work portfolio, including 15 at the country level, three regional (multi-country) initiatives, and four new projects that are in the pipeline.[19] Additionally, it includes three projects from the investment portfolio that were considered for some segments of the analysis. There are 21 countries represented in the pool of projects, spanning the geographic mosaic of the Latin America and the Caribbean region. (See Figure 2 for the geographic distribution of the projects.)

Figure 2: Map of IDB Future of Work projects, 2016-2019

Regional Projects

FORGE — Argentina, Chile, Mexico, Peru, & Uruguay

EmpleaTECH — Dominican Rep., Salvador, & Guatemala

sportic — Argentina, Colombia, & Ecuador

1.1 Types of training models

While the overarching objective of each of the projects is to strengthen the educational and employability opportunities of children and youth facing conditions of vulnerability, individual projects tackle this objective from different angles and with different strategies. The diversity of training and employability approaches attends to the different social, economic, and political dynamics of each particular context, as well as the resources available for their design and implementation. The projects either focus on a particular element of the education and employment ecosystem or target a broad spectrum of elements to address both upstream and downstream factors that affect youth employability in the knowledge economy in the region.[17]

A common thread across all training models and employability programs is an emphasis on developing different levels of digital skills, ranging from basic digital literacy to more advanced digital skills such as programming and augmented virtual reality (AVR) development. The programs also build socio-emotional skills (SES) such as teamwork, collaboration, communication, and empathy; and they provide job placement services to better position young women and men in the labor market. For the majority of young people participating in these training programs, the employment pathways offered by the projects represent a bridge to their first job in the knowledge economy and/or their first time in formal employment. A handful of projects, especially those working with younger populations, have long-term employability strategies that place an emphasis on building foundational skills in early education (math, science, logical and computational thinking) and on continuing education.

In terms of training models, the types of projects within the IDB Lab Future of Work portfolio can be broadly grouped into three categories. (See Figure 3 for the distribution of projects by type of training model.)

1. Blended learning (face-to-face instruction combined with online learning tools)

Projects in this category combine face-to-face training methodologies, mediated through an instructor, with student self-directed learning using online tools. Within this group there are three subcategories of training models: 1) bootcamps; 2) part-time training; and 3) training integrated into educational institutions' curricula or activities. This type of training model encompasses 17 projects — the vast majority of those in the portfolio — and is also the most diverse in terms of target groups, skills developed, and educational and employment strategies.

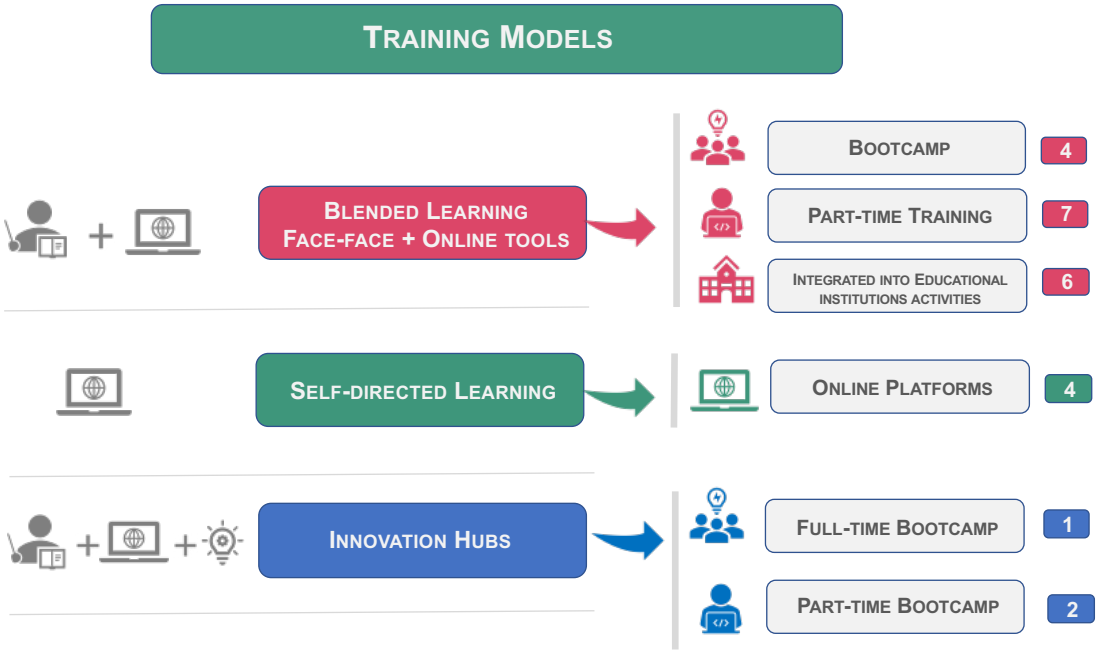
2. Self-directed learning (online platform as core strategy for training and career guidance)

Projects within this category center their training strategy in an online platform, and learning is not mediated through an instructor. This category of training model includes four projects — two that are part of the IDB Lab Future of Work portfolio and two investments.

3. Innovation hubs (centered around entrepreneurship)

Projects within this category follow a similar training approach to blended learning but place a strong emphasis on developing entrepreneurial skills as the employment strategy. These projects also offer a different set of digital skills from the rest of projects, including AVR programming, design and multimedia, and data literacy. There are three projects that fall into this category of training model.

Figure 3: Distribution of IDB Lab Future of Work and investment projects by type of training model



Source: Projects' donors memoranda, PitchLab memos, and interviews with representatives from a selected group of projects (6).

1.1.1 Development of innovative blended training models that combine face-to-face learning, mediated through an instructor, with online learning

The training programs in this category use a blended training approach that combines face-to-face learning, mediated through an instructor, with student self-directed learning using different online tools. This category encompasses almost 70% of the project portfolio (17 projects). In these projects, the core strategy is centered around developing new training methodologies that include the creation of training materials and pedagogical tools for trainers (teachers, organization instructors, tech company trainers, school counselors, etc.) and students. These new methodologies are either fully developed from scratch or adapted to the local context from an already existing training model. The latter approach to training development is particularly prevalent in early education programs that include math and computational thinking as core skills of their training. (For example: Jaque Mate in Bolivia adapted content from the Khan Academy platform; and UpSocial in Chile implemented a localized version of JumpMath, created by a Canadian NGO.)

Regardless of the approach, all the training methodologies are designed to engage students in the learning process in a more interactive manner through the use of agile learning, design thinking, and gamification, among other techniques. While all training models in this category of projects use a blended learning approach, the format, duration, intensity, and level of digital skills they advance vary significantly across projects. This distinction is important when assessing the progress of the projects, the resources needed to implement and sustain the projects in the long run, and the employability and learning outcomes for participants. Within this group, there are three main training models: 1) bootcamp (four projects); 2) part-time training (seven projects); and 3) learning integrated into formal education settings (six projects). (See Figure 4 for the projects that fall within each subcategory of the blended learning training model.)

1. Bootcamp

This is the most intensive training model in the portfolio. Under this training model, students are required to attend the training for 3-6 hours each day, usually for a period of at least six months, in order to graduate from the program and obtain a certificate. The four projects that fall into this subcategory of blended learning have some variations in their training strategy and the skills they develop. Laboratoria, which currently operates in Peru, Chile, Mexico, Brazil, and recently in Colombia, has the most intensive training model in the portfolio, requiring students to enroll in the program full-time for a period of six months. This bootcamp prepares young women from vulnerable backgrounds to work as junior programmers in front-end development and UXD (user experience design) after completing the program. (See Case Study 2 for more information about the project.)

Jovenes a Programar in Uruguay also trains young women and men to pursue junior programmer careers in the software industry, but requires students to enroll part-time and complete 144 hours of total training for six months. (See Case Study 1 for more information.) In addition to basic programming skills, the students also receive training in socio-emotional (teamwork, collaboration, adaptability, etc.) and English skills. This is the only program in the portfolio that lends a laptop to each student for the duration of the training. One project currently in the pipeline, DevF, also has a similar bootcamp training approach.

The Valentina program in Guatemala also uses a bootcamp training approach, with students completing 180 hours of training in six weeks in order to graduate and obtain certification. Although this program also includes training in socio-emotional and language skills, it centers its technical training on productivity tools such as MS Office and the Google suite, among others, to prepare students for formal employment in junior positions working in industries such as health, telecom, and retail. (See Case Study 3 for more information.)

Figure 4: Projects within each subcategory of blended learning training model (N=17)

Project	Country	IDB Lab
Laboratoria	Regional	2015
Dev.F	Mexico	Pipeline
Jóvenes a Programar	Uruguay	2017
Valentina	Guatemala	2017

Project	Country	IDB Lab
IncluTech	Argentina	2017
BIS	Colombia	2016
F. Monge	Costa Rica	2016
Automotriz	Mexico	2017
EmpleaTech	Regional	2017
F. Forge	Regional	2019
Google.org	Regional	Pipeline

Project	Country	IDB Lab
Jaque Mate	Bolivia	2017
NEO	Brazil	2016
NEO	Chile	2016
UpSocial	Chile	2017
Tech & Sports	Regional	2019
Lab4U *Investment	Chile, Mexico	2015

Source: Projects' donors memoranda, PitchLab memos, and interviews with representatives from a selected group of projects (6).

Despite some slight differences in the intensity of training and the skills developed, all the projects within this subcategory of blended learning share four common elements:

- All the programs use a thorough student selection process, in which interested participants are required to do a psychometric test to assess factors such as ability to self-learn, motivation, values, and ethics, and are interviewed by the program managers and staff. This strategy is primarily designed to mitigate student dropout.
- The trainings are based on agile learning and design thinking methodologies aimed at re-creating the dynamics of an everyday work environment.

- Students join the training for free and are only required to pay the cost through monthly installments once they are employed. This represents a key sustainability strategy for the programs, but it is not without challenges, as discussed in the next chapter.

2. Part-time training

This model is less intensive in terms of the time required for students to complete the training using a variety of methodologies and strategies. Based on the available information, there are seven projects that fall within this category. The projects vary greatly in their training approaches, type of skills, and target groups. For example, **Fundacion Monge in Costa Rica** developed an extensive training program targeting three sets of youth groups: 1) upper secondary students in technical schools; 2) upper secondary students in non-technical schools who will receive technical training during the program; and 3) graduates from technical schools who are unemployed. The training incorporates virtual reality as a learning tool to help young people get immersed in work environments and practice the skills acquired during their training.

3. Learning integrated into formal education settings

This training model is prevalent among projects that provide math, computational thinking, and other foundational skills targeting younger populations. The training is embedded into school learning activities, with students attending classes at the school labs three times a week for 2-3 hours per day, along with some additional hours for self-directed learning. Examples of this modality are **Jaque Mate**, which works with students in Bolivia during the last four years of their high school education (see Case Study 4 for more information), and **UpSocial**, which works with younger students in third and fifth grade of primary school in Chile.

Although the core of the training happens within school settings, both projects also include elements of self-directed learning, with programs offering a range of online tools that students and teachers can use to complement the face-to-face, instructor-mediated learning experience. One investment also falls within this category: **Lab4u** (Chile and Mexico), which promotes a culture of science among students and teachers in secondary schools, offering online training tools to improve knowledge in physics, chemistry, and biology.

A common element of these projects is an emphasis on building teaching and pedagogical capacity for instructors through train-the-trainers programs, which are a core part of the projects' educational strategy.

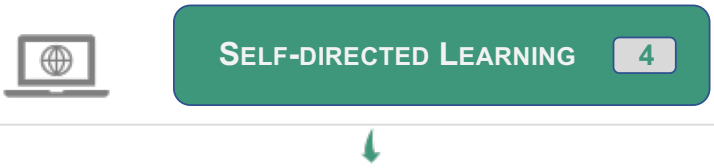
Jaque Mate in Bolivia has helped over 20,000 young women & men improve their math and computational thinking skills

Source: Jaque Mate, Bolivia

1.1.2 Self-directed learning and career guidance on online platforms

This category of training model encompasses 20% of projects included in the analysis. This percentage represents two projects in the IDB Lab portfolio that fit into this category, including one of the new projects in the pipeline — **Fundación Telefónica in Chile and Colombia** — and two projects from the investment portfolio, included in some segments of the analysis. (See Figure 5.) Projects that use an online platform as a core strategy for skills training, career guidance, and job preparation have some common elements embedded into their training strategy — for example, creating users' education and employability profiles to tailor the range of courses they must follow in order to apply for specific jobs in the knowledge economy.

Figure 5: Self-directed learning projects that use an online platform as a core training strategy



Project	Country	IDB Lab
Bola de Cristal	Costa Rica	2018
Telefonica.org	Chile, Colombia	Pipeline
Crehana | *Investment	Colombia & Mexico	NA
Workana | *Investment	Argentina	NA

Source: Projects' donors memoranda, PitchLab memos, and interviews with representatives from a selected group of projects (6).

There is an increased trend among this type of project to implement components of machine learning and artificial intelligence into the platforms to better guide and inform people about what occupations are in demand in the labor market and to match this demand with the skills needed to apply for those jobs. **La Bola de Cristal in Costa Rica** is a prime example of this trend, as are the two investments: **Workana (Argentina)**, a marketplace for freelancers in all areas related to the knowledge industry; and **Crehana (Colombia and Mexico)**, which offers more than 500 project-based online courses in areas ranging from basic to advanced digital skills, innovation, creativity, design, and socio-emotional skills.

1.1.3 Entrepreneurship and innovation hubs

There are three projects that seek to create innovation hubs to promote skill development and entrepreneurship (two in the Dominican Republic and one in Suriname). These three innovation hubs offer different types of technical skills training programs from the rest of the projects in the portfolio and place a strong emphasis on creating entrepreneurial activities as an employability strategy. The training models of two of the projects within this category follow the same intensity and format as a full-time bootcamp with additional training on business plan development and services directed to raising investments for their entrepreneurial activities. (See Figure 6)

For example, the **Center for the Development of Interactive Digital Technologies (IDC) in the Dominican Republic** is the only project in the portfolio that offers advanced digital skills training in AVR technologies with a focus on the entertainment industry. The training model is organized as a full-time bootcamp, with students attending 20 hours of training each week for a period of eight months. Young people have the option of working at the Center or developing their own entrepreneurial endeavors once they have successfully graduated from the extensive training program. (See Case Study 5 for additional information.) Stitching the **BackLot in Suriname** designed a similar training model, but its focus is on design, creativity, and multimedia skills. The training period lasts for 12 months, with six months of intensive training (five hours per day, three times a week), followed by project-based training and entrepreneurship instruction for varying lengths of time.

Figure 6: Entrepreneurship and Innovation Hubs

Project	Country	IDB Lab
Interactive Digital Technologies	Dominican Republic	2016

Project	Country	IDB Lab
Creative Industries and Technology Hub	Suriname	2016
Laboratorio de Innovacion Territorial	Dominican Republic	2017

Source: Projects' donors memoranda, PitchLab memos, and interviews with representatives from a selected group of projects (6).

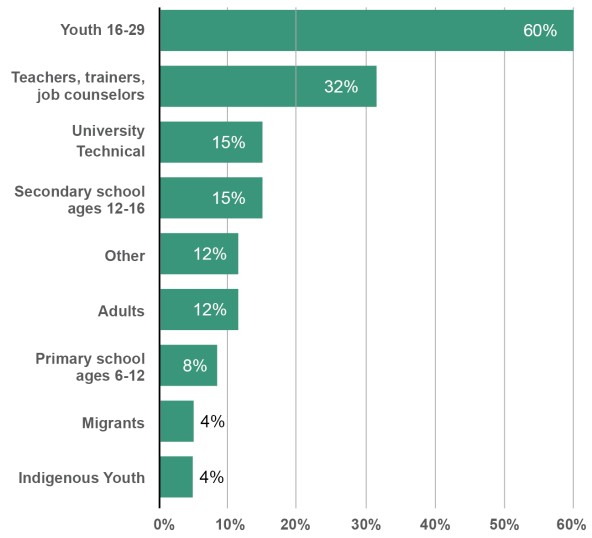
1.2 Key target groups and range of skills advanced by the projects

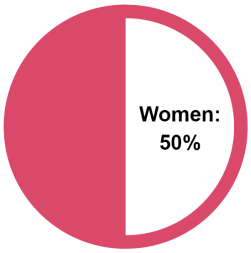
1.2.1 Youth 16-29 years old, women, and trainers are the three main target groups

Youth 16-29 years old who are either low-income or come from vulnerable socioeconomic backgrounds are the largest target beneficiary group of the programs, with most projects targeting participation levels of 50% women. (See Figure 7.) The project **Valentina in Guatemala** set the highest target of women's participation, at 65%; and **Inclu-tech in Argentina** set the lowest, at 30%. After youth and women, trainers and teachers comprise the third largest target group, at 32%, followed by secondary school youth (12-16 years old) and university or technical college students, at 15% each. (See Appendix 1, Table 1 for the groups targeted by each of the projects.)

Source: Valentina, Guatemala

Figure 7: Percentage of target groups, by type (N=21)





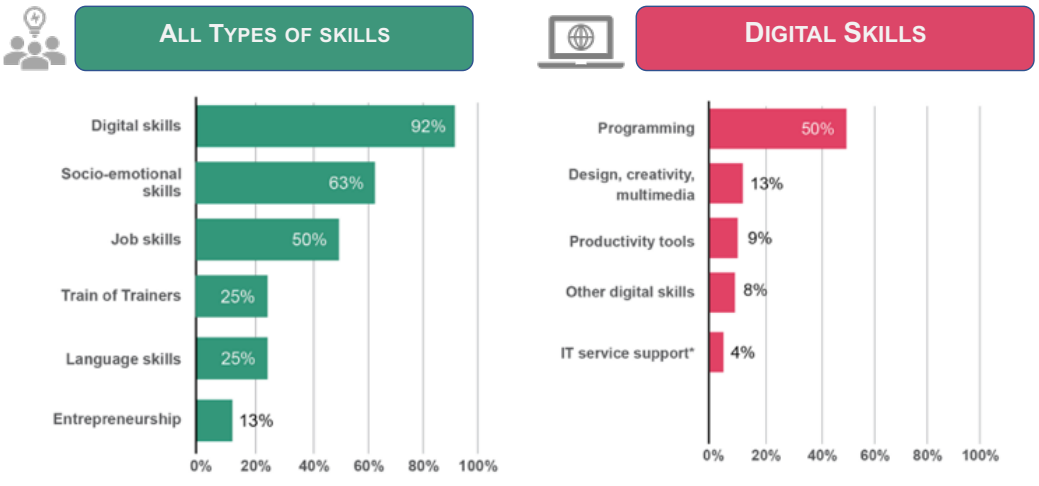
Notes: *Other includes human resources teams (Habilidades para el Futuro, Regional); families of youth participating in training programs (Digitalización de la Fuerza Laboral en el Sector Automotriz, Mexico); local entrepreneurs (Laboratorio de Innovación e Inteligencia Territorial, Dominican Republic); tech company leaders (Laboratoria, in pipeline); and freelancers (Workhana). Percentages do not add up to 100, since projects generally target multiple populations.

Source: Projects' donors memoranda, PitchLab memos, and interviews with representatives from a selected group of projects (6)

1.2.2 Digital skills, socio-emotional skills, and job preparation are the three most prominent types of skills advanced by the projects

The types of skills training offered align with the overall goal of promoting youth employment in the knowledge economy. (See Box 1 for a description of the different digital skills advanced by the projects.) Thus, most programs are geared toward enhancing a range of technical skills, from basic digital literacy to advanced technology development. Different levels of programming skills dominate the spectrum of digital skills promoted by the projects. (See Figure 8 for a breakdown of the types of digital skills.) Several projects also prioritize training in a selection of socio-emotional skills (SES).[20] (See Figure 9 for the different types of SES.) Employment-related skills are provided by about two-thirds of the projects. Language, particularly English, is another important feature of almost 25% of the projects. (See Appendix 1, Table 1 for the different skills provided through each project's training program.)

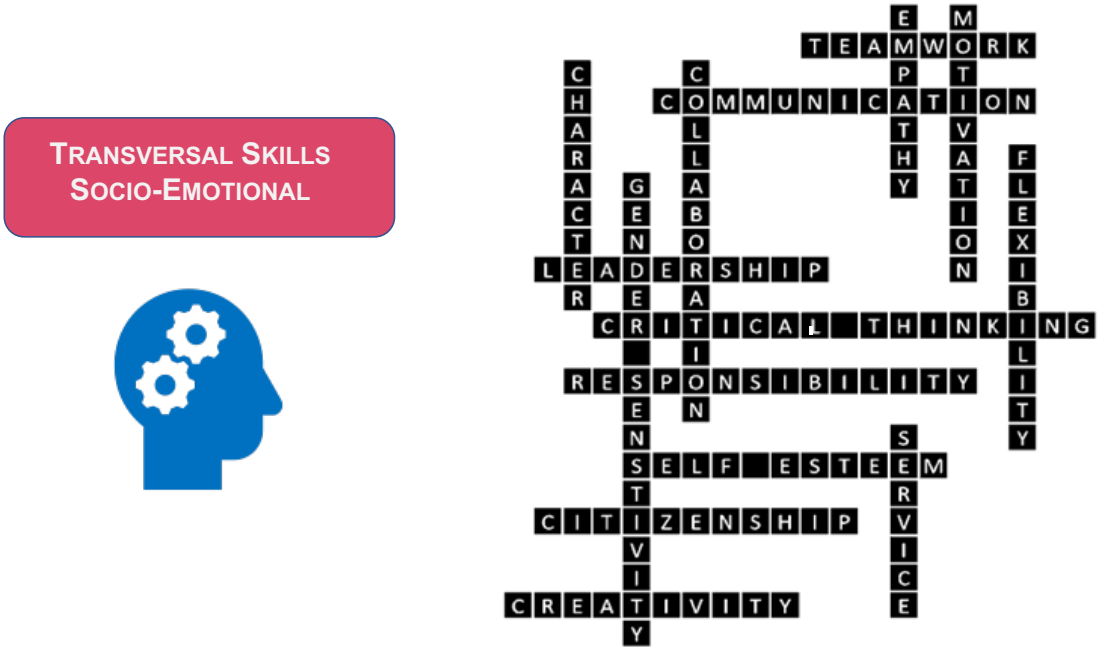
Figure 8: Types of skills promoted by the projects (N= 22)



Notes: Percentages do not add up to 100, since projects generally target a multiple set of skills.

Source: Projects' donors memoranda, PitchLab memos, and interviews with representatives from a selected group of projects (6)

Figure 9: Range of socio-emotional skills developed by the projects (N=24)



Note: There is no information on the types of SES skills developed by three projects (Bola de Cristal, Costa Rica; NEO, Brazil; and NEO, Chile).

Source: Projects' donors memoranda, PitchLab memos, and interviews with representatives from a selected group of projects (6).

Box 1: Description of digital skills promoted by IDB Lab projects

1. Basic digital literacy: basic computational thinking, connecting devices, responsible and productive use of social networks, and digital citizenship
2. Design, creativity, and multimedia production: Photoshop, Canvas.com, social media architecture, and commercial and technical production of creative/ cultural events
3. Productivity tools: Excel, Word, Outlook, Access, Videoconferencing
4. Programming, software testing, computational thinking: Programming tools including Ruby, Python, Web 2.0, HTML5, CSS, JavaScript, PHP, ASP, NET, and AVR (includes web and mobile programming and software fundamentals)
5. Data processing (SAP) and Business One (B1) for small and medium size enterprises
6. Robotics and AVR
7. Other: Data literacy, IT administration, digital citizenship

1.3 Elements and strategies to achieve educational and employability outcomes for youth

Based on the consultants' review of the project goals and components outlined in the project descriptions, six types of potential project elements were identified (see Figure 10):

1. **Basic education** (math and other computational skills training at the elementary school level)

2. **Training of trainers** (training for teachers, instructors, or managers)
3. **Digital skills and SES development** (different levels of digital skills training as well as life skills training such as communication and teamwork)
4. **Job preparation and career guidance** (helping job seekers prepare for and navigate the job market; this includes career counseling)
5. **Job placement and retention** (connecting job seekers and employers, providing job placement services, and supporting employee retention)
6. **Continuing education** (supporting students in their transition from school to higher education to pursue technical or university degrees)
7. **Entrepreneurship development** (providing entrepreneurship training and/or business incubation facilities and support)

Most projects focus on developing a variety of digital skills, socio-emotional skills, and, in some cases, language skills for youth ages 16-29; only two projects (**Laboratorio de Innovación** e Inteligencia Territorial para Ciudades Dominicanas, **Dominican Republic**, and **UpSocial, Chile**) do not have any of these as a main feature of their programming. The former focuses on building entrepreneurial opportunities around data science initiatives. The latter targets younger children (grades 3-5 of primary school) with an early education program to inculcate math and computational thinking skills as foundational preparation for future training needs. (See Figure 9 for a summary of the training and employment strategy elements.)

Figure 10: Training and employment strategy elements (N=23)

Source: Projects' donors memoranda, PitchLab memos, and interviews with representatives from a selected group of projects (6).

Providing job preparation skills, such as building a CV, preparing for interviews, and searching and applying for jobs, is also a dominant target (19 projects). This tends to go hand-in-hand with job placement and retention services (14 projects). In general, high priority is given to fostering employment, especially within the private sector, with only four projects directing their efforts toward entrepreneurship development. Ten of the projects include training of trainers. These programs incorporate activities to prepare and assist not only teachers to deliver skills education to students, but also school counselors and industry professionals to support job seekers along the employability path.

The more elements a project includes, the more holistic it can be said to be. However, the comprehensiveness of programs does not guarantee their success, as this depends on a variety of mediating factors such as the national context, project objectives, target populations,

and international economy. In this respect, several projects cover a broad spectrum of elements. (See Appendix 1, Table 1, for the training and educational elements included in each of the projects.)

Knowledge creation and transfer is a common theme across projects, either for scaling projects or extending them to other agencies, sectors, or countries (14 projects). Some of the projects aim to test, compare, and contrast different training and employment program models for the benefit of other agencies, while others approach knowledge creation as a way to evaluate their programs and inform scalability plans. (See Figure 11 for a summary of the emerging elements in the IDB Lab portfolio, by year.)

Figure 11: Emerging elements in the IDB Lab Future of Work portfolio 2015-2019

	2015	2016	2017	2018	2019
CONTRIBUTIONS	$2.08	$24.8	$23.8	$2.8	$11.7
# PROJECTS	1 project	5 projects	9 projects	1 project	7 (3 pipeline)
TRAINING MODELS	– Full time bootcamp	– Part-time training – Innovation Hub w/ full time bootcamp	– Part-time training – Innovation Hub – Integrated in educational institutions	– Self-directed learning (online platform)	– Full time bootcamp – Part-time bootcamp – Self-directed learning
TARGET GROUPS	– Young women	– Youth 16-29 – Teachers, Counselors – Secondary students – Technical & University	– Indigenous youth – Primary students – Family of youth	– Adults	– Migrants – Tech company leaders – Human resources teams
TYPES OF SKILLS	– Programming – front and backend – Job skills	– Basic digital skills – Programming AVR – Language skills – Entrepreneurship	– Mathematics, logic – Productivity tools – Design, Multimedia – Programming – Robotics Basics	– Broad spectrum of digital skills	– Programming – IT Support – Robotics Basic – Digital Citizenship
	Transversal skills | Socio-emotional skills and job skills				
EMERGING TRENDS	– Focus on women as creators of technology	– Gamification as training tool – Programming in frontier technologies (AVR) – Entrepreneurship model – Social Impact Bonds (BIS)	– Foundational skills in early education (math) – First project targeting >50% of women and indigenous youth – More diverse set of digital skills training programs	– Use of machine learning to match candidates with job market and skills development pathway	– Continued trend machine learning and AI use. – First effort to target tech company leaders with diversity training. – Efforts to diversify type of employers (SMEs and startups)

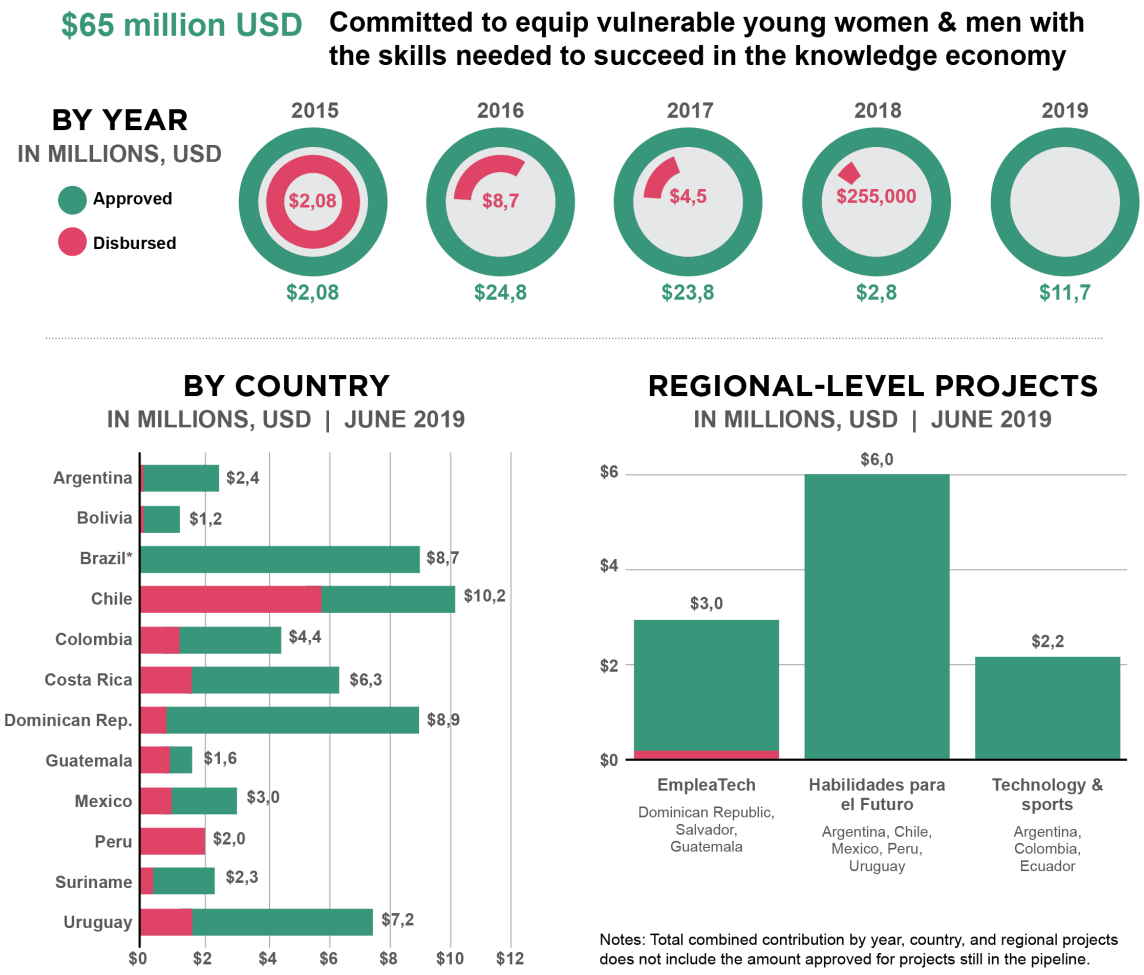
Source: Projects' donors memoranda, PitchLab memos, and interviews with representatives from a selected group of projects (6).

1.4 IDB Lab's combined contribution to equip vulnerable young women and men with knowledge economy skills reached almost $65 million USD from 2016 to 2019.

This section presents the latest available data of the combined IDB Lab and counterparts' financial contributions to the projects in the past five years. As the previous sections showed, the IDB Lab Future of Work portfolio includes a wide variety of projects that tackle training and employability strategies in different ways, requiring different levels of resources to achieve their targeted goals. Another important consideration is that the vast majority of projects currently in the portfolio (80%) are 2-3 years old; one project is just a year old; and the remaining projects started only in 2019. The only exception is Laboratoria's project in Peru, Mexico, and Chile, which has been part of the portfolio for four years and was recently approved (November 2019) to receive a second round of funding. The data for projects approved after June 2019 is not included in the analysis.

Between 2015 and 2019, the total combined approved contribution — in non-reimbursable technical cooperation — from IDB Lab and its counterparts reached almost $65 million USD for the 18 projects in the portfolio with signed agreements. Of this amount, $17.8 million (28% of the total) was committed by IDB Lab and slightly over $45 million by its counterparts — a ratio of almost 1 to 3. As of June 2019, IDB Lab had disbursed more than 30% of the total approved contributions, while the counterparts for the different projects had disbursed only 18% of the resources committed. The combined contribution amounts ranged from $1.2 million to $8.7 million for country-level projects and from $3 million to $8 million for regional-level projects. (See Figure 12 for IDB Lab and counterparts' combined contributions by year, by country, and for regional-level initiatives.)

Figure 12: IDB Lab and counterparts' combined contributions by year, by country, and for regional-level initiatives



Notes: Total combined contribution by year, by country, and for regional projects does not include the amount approved for projects still in the pipeline.

Source: IDB Project Progress Reports, June 2019.

1.5 Innovative training approaches to skills development and to fostering the employability of young women and men

This section outlines the major strategy trends identified in four areas: 1) training design and delivery; 2) employer engagement; 3) inclusion of women and other underrepresented groups; and 4) strategies for sustainability.

1.5.1 Trends in training design and delivery

Innovations in training methodologies and delivery channels are key ingredients for offering new learning opportunities to youth who face conditions of social or economic vulnerability. These innovations also represent an important steppingstone for improving their job opportunities in a labor market that is in flux, with new types of jobs constantly emerging as technologies evolve and the demand for skills changes. In a region characterized by underfunded public education systems and pedagogies that are outdated, training programs that use innovative methodologies, applied in formal and informal learning settings, can help bridge the educational gap for marginalized youth and expand their skill sets as well as their job frontiers.[21] The major trends identified in this area include:

- **Prevalence across all projects of training in socio-emotional skills, including but not limited to teamwork, collaboration, empathy, digital citizenship, critical thinking, creativity, and self-esteem**. The emphasis on integrating socio-emotional skills development as a core training element reflects the IDB strategy since the early 2000s, aimed at building soft skills through its training programs.

- **Growing use of innovative training methodologies, such as agile learning, design thinking, gamification and virtual reality, and hackathons** that offer more interactive and ludic learning opportunities for students while strengthening both their technical and socio-emotional skills. In addition, since these types of methodologies are commonly used in knowledge industries, particularly in software design and development, students participate in learning activities that mirror actual work dynamics.

- **Increased emphasis on building the foundational skills** that are critical for entering and succeeding in the knowledge labor market, especially for programming and software development jobs. These foundational skills encompass primarily math, computational thinking, and logical thinking. These efforts usually target younger students at the primary and early secondary education levels, as is the case with Jump Math in Chile and JaqueMate in Bolivia.

Source: Fundación Monge, Costa RIca

- **Efforts to design more comprehensive training programs that tackle skill development for a broader spectrum of actors, not only students**. This includes teachers, trainers, school counselors, students' family members, and human resources teams from the private sector. These broader training strategies serve as an important complement to skill development, especially for school teachers, who lack other opportunities to update their teaching methodologies.

- **Input from the private sector in curriculum design and development of training content.** In an effort to design training programs that better match the skills demanded in the labor market, many projects have implemented a variety of strategies to include private sector representatives in their training design. These strategies include recruiting trainers and job counselors from industry and partnering with organizations that have an established, industry-recognized training methodology.

- **Increased use of frontier technologies as training tools and as a specific type of skill set developed by the program.** Several projects are developing advanced gaming and AVR platforms that serve as key components of their training programs. There are also efforts in the online platform-based projects to use machine learning and AI technology to better tailor training programs for users and tackle the challenge of scalability. Three projects in the portfolio are specifically developing advanced digital skills as the end objective: the Center for the Development of Interactive Digital Technologies in the Dominican Republic offers training in AVR; and Technology and Sports: Education for the Future and Jaque Mate in Bolivia offer basic training in robotics for qualifying program participants.

IDC offers an intensive coding bootcamp to train youth in AVR programming skills.

Source: Interactive Digital Center, Domiican Republic

1.5.2 Trends in employer engagement to increase young people's employment rate

Generally, programs that address the supply side of the labor market — potential young job seekers — often face challenges successfully placing participants of their training programs into jobs. Lack of experience, poor educational settings, gender and racial discrimination, and limited possibilities for networking are among the major obstacles that young people face when looking for a job. These conditions are further exacerbated when youth come from vulnerable socioeconomic environments. There are a variety of strategies that IDB Lab projects are implementing to tackle this important component of the employability path:

- **Partnering with networks of companies that open up their hiring to students graduating from the training programs, and in some cases commit to hiring a certain number of students**. These partnerships are often facilitated through relationships with chambers of commerce, as is the case with ARGENCON in Argentina; through established business networks, such as Forge's network of 100 companies and Google.org's proposed hiring consortium (in pipeline); or through arrangements with companies that pay a fee when hiring graduates from the programs.

- **Involving trainees and mentors from the private sector in the training design and delivery and to assist training participants in their job preparation path.** The participation of the business sector in co-creating the training methodologies and content design is an important strategy to develop training programs that match the skills needed in the labor market. Examples include Valentina in Guatemala, Jóvenes a Programar in Uruguay, and Generando Capacidades in Costa Rica.

- **Incorporating small and medium enterprises (SMEs) and start-ups, within the tech ecosystem and in other sectors that are undergoing digital transformation, as potential employers for youth.** This trend reflects an emerging change in the employability strategy of some projects to overcome the lack of hiring mechanisms for young talent in big tech companies, and the resulting lower employment offerings

for youth graduating from the programs. Laboratoria in Peru and Valentina in Guatemala are implementing this strategy.

1.5.3 Strategies for increasing the participation of women and minority groups in the training programs and improving their standing in the labor market

Despite considerable progress in the past two decades, women remain significantly underrepresented in STEM education and STEM-related occupations all over the world. The latest available statistics show that women represent on average 30% of the STEM student body in higher education and 25% of the STEM labor force.[22] In Latin America, the situation for women is further exacerbated by social and cultural codes that limit their educational opportunities and career choices.[23] All the projects in the IDB Lab portfolio include plans to increase the participation of women in the training programs; however, there are few details on the actual strategies that will be implemented to achieve this aim. Among the few identified are:

- **Implementing information campaigns in communities**, schools, social organizations, and other social spaces to raise awareness about the training programs, increase women's participation and retention in the training programs, and sensitize their families and communities to see careers in the knowledge economy as attractive options for women.

- **Designing training with flexible schedules and during times that are considered more safe for women** to commute in order to increase their participation in the training programs. In Latin America, women face more mobility challenges than men, including harassment and the threat of sexual violence.[24] For this reason, training schedules are a very important consideration in program design.

- **Recruiting female trainers who can serve as role models** for young women, or trainers who are experienced with gender and diversity approaches to teaching and learning.

- **Partnering with companies that have a good record of diversity hiring** and are more welcoming to women job candidates.

- **Developing training programs for technology company leaders to raise awareness about the benefits of hiring women as well as other underrepresented populations** and diversifying their pool of talent. Recent research shows how more diverse teams in the tech industry can foster innovation, increase productivity, and develop better products and services.[25]

Jóvenes a Programar has trained 1500 young women and men in different programming languages using agile and design thinking methodologies.

Source: Jóvenes a Programar, Uruguay

1.5.4 Sustainability strategies

Sustainability plans are interlinked with the various projects' assessment of their scalability potential. Within these assessments, plans for sustainability are couched in generic terms ranging from statements that the project will develop a sustainability strategy to intentions to commercialize the project outputs. Several projects note that sustainability plans will come into play only if the project model is found to be successful. Overall, those projects that provide some details tend to envision one or more of several possible social and financial sustainability scenarios:

- **Formal alliances with public- and private-sector stakeholders:** A key sustainability strategy has been to establish multi-sector alliances at the local, national or international levels.

- **Stakeholders such as government agencies, the private sector, and civil society contribute to project activities with resources, knowledge, and connections.** These alliances facilitate stakeholder buy-in and project implementation, but also offer the potential for continued support for the projects after the financing period ends.

- **Partner adoption of project methodologies:** Several projects anticipate that project partners will adopt and carry forward the methods and outputs of the projects after the funding period.

- **For example, projects building on existing government programs hope that the government will integrate the project approach for the longer term.** Some implementing organizations also aim to transfer relevant knowledge and skills to schoolteachers and trainers who can continue implementing the project methods. Such approaches require the strong awareness and involvement of partners (including government departments, teachers, school directors, families, communities, and companies) in training design and implementation.

- **Project restructuring:** As dictated by project experiences, some projects intend to review and adjust project goals, activities and targets (such as reducing the length of training periods, introducing new training elements, or reducing the number of students targeted). With more realistic project designs and outcome expectations, it more likely that the project will survive over time.

- **Revenue generation:** Some projects plan to become self-sustaining or gain access to alternative funding avenues to sustain them or allow them to scale up. One project indicates that counterpart funds exceed the required minimum, leaving excess revenue in the existing budget to keep the project going. Other projects plan to generate revenue either through commercialization of the project outputs (e.g. creation of social enterprise, licensing of training methodologies, etc.) or through student program fees and employer hiring fees.

This chapter presented the categorization of the projects in the IDB Lab 2015-2019 portfolio. Projects were organized and classified according to different defining characteristics such as the types of projects, elements, and strategies to improve learning and employability outcomes; the types of target groups; and different skills provided as part of the programs. It also included a thorough discussion about the most innovative aspects of the training and employability models in terms of training design, employer engagement, and sustainability plans, among others. (See Appendix 1, Table 1, for a summary of this analysis by project.)

Chapter 2

Progress assessment and lessons learned for future program strategies

This chapter presents an overview of the progress of the projects in the IDB Lab portfolio from 2015-2019, drawing on the most prevalent quantitative and qualitative performance indicators. It includes a discussion of the main potential risk factors and associated mitigation strategies that have affected or could affect the design, implementation, sustainability, and scalability of the projects. As part of this discussion, we identify some of the most relevant lessons learned in six key areas that could inform strategies for current projects and serve as a guide for future programmatic decisions by IDB Lab. This combined analysis serves as the basis for the recommendations emerging from this study.

There are some important considerations for interpreting the analysis presented in this chapter:

- The progress assessment includes only a selected number of indicators (13) and is not intended to be comprehensive. As the previous chapter showed, the projects vary significantly in objectives, implementation strategies, and resources, and this diversity is reflected in the variety of indicators they select to track progress. Projects include in their results matrix an average of 25-30 progress indicators that map to the different components that shape their training and employability strategies. The 13 indicators were selected because they were consistently found, to some extent, across all projects, thereby enabling some comparability.

- The results presented in this chapter thus do not paint a full picture of their progress against the individually established targets.

- The analysis includes data from 18 of the 25 projects included in the categorization analysis. It does not include progress data from the IDB Lab projects in the pipeline and the three investments.

- The projects are at different phases of implementation, and this may affect the results of the analysis for the selected progress indicators. Although 80% of the projects started between 2016 and 2017, there is one project that is a year old and two that just started in 2019, so their progress reports are at early stages of completion or have not started yet.

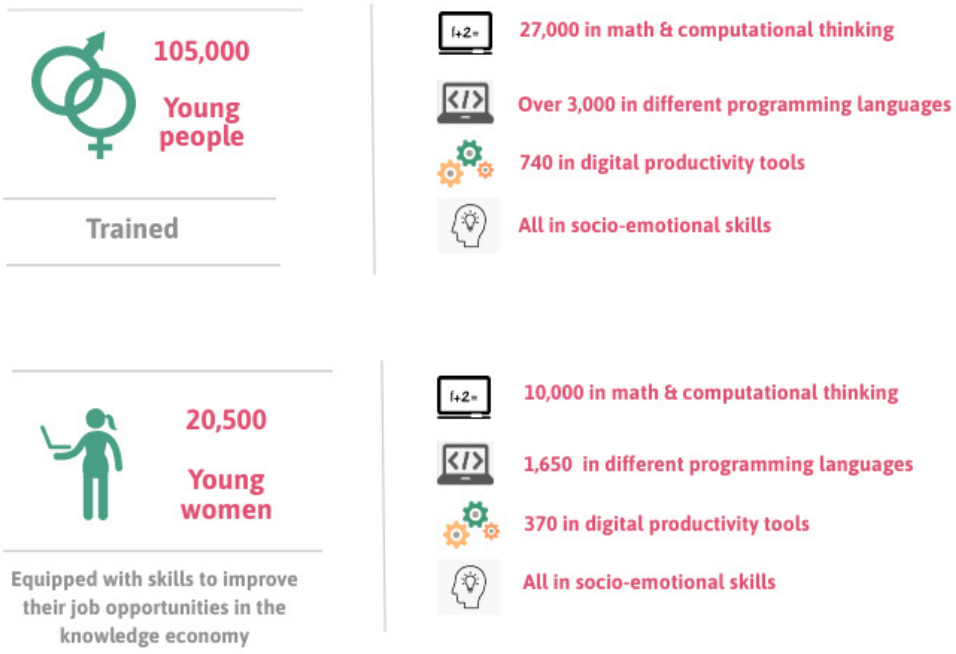
- A number of projects currently do not report gender disaggregated data for their training and employability outcomes. As a result, the results reported in the analysis may underestimate the total number of women trained and employed.

- The data is self-reported by the projects' executing agencies and was not independently verified for the purpose of this study.

2.1 More than 100,000 young women and men participated in training programs between 2015 and 2019

Between 2015 and 2019, **more than 100,000 young women and men participated in the training programs offered by IDB Lab projects (almost 50% of the combined total target number).** Of this total, more than **20,000 were young women,** representing 30% of the progress against the combined established target of 68,000. Projects with train-the-trainer programs reported **equipping more than 1,400 teachers, instructors, and school counselors with new teaching methodologies and tools** to better prepare students for the educational and labor demands of the knowledge economy. (See Figure 13 for a summary of the main educational outcomes between 2015 and 2019.)

Figure 13: Educational outcomes for young women and men, 2015-2019



Notes: Total number of young women trained was calculated with data available for 16 projects. Three projects do not include gender-disaggregated data in their progress indicators (NEO, Brazil; NEO, Chile; and UpSocial, Chile).

Source: IDB Project Progress Reports, June 2019

Our analysis found e**ight new training methodologies based on agile learning and design thinking with innovative teaching tools, and nine online training platforms that were developed during this period.** (See Figure 14 for more information.) Some examples of the training methodologies include a train-the-trainers program adapted from Khan Academy content to provide teachers in secondary education with innovative tools to improve math and computational thinking skills for their students; an AVR-intensive training program adapted from EON Reality to the local context; and a training program in productivity software to help young people gain employment in junior administrative positions in different industries.

Source: Fundación Comunitaria del Bajío, Mexico

Figure 14: Combined progress toward targets of young people trained and employed, by year

Source: IDB Project Progress Reports, June 2019

As we noted previously, the projects vary significantly in their objectives, educational and employability strategies, targeted outputs and outcomes, and phases of implementation. Even for projects that started in the same year, progress toward their targets may vary depending on these conditions and additional external factors, such as upward or downward trends in the economy that can directly impact outcomes. With this in mind, the combined progress of the projects by year of funding paints an optimistic picture of the projects' efforts to reach the targeted number of young people trained. **Projects funded in 2016 (four), have reached 68% (63,000 out of 92,500 young people) of their combined target numbers for all young people trained, and 64% of their target numbers for women trained**. For projects funded in 2017 (10), those percentages reach 83% and 96%, respectively. (Not all projects funded that year show the same progress against their target.) The only project funded in 2018 (Bola de Cristal in Costa Rica) is close to achieving the target for total number of young people trained, at 93%, but it has not experienced the same progress for young women trained — just 31%. (See Figure 15: Combined progress against targets for young people and young women trained and employed by year.)

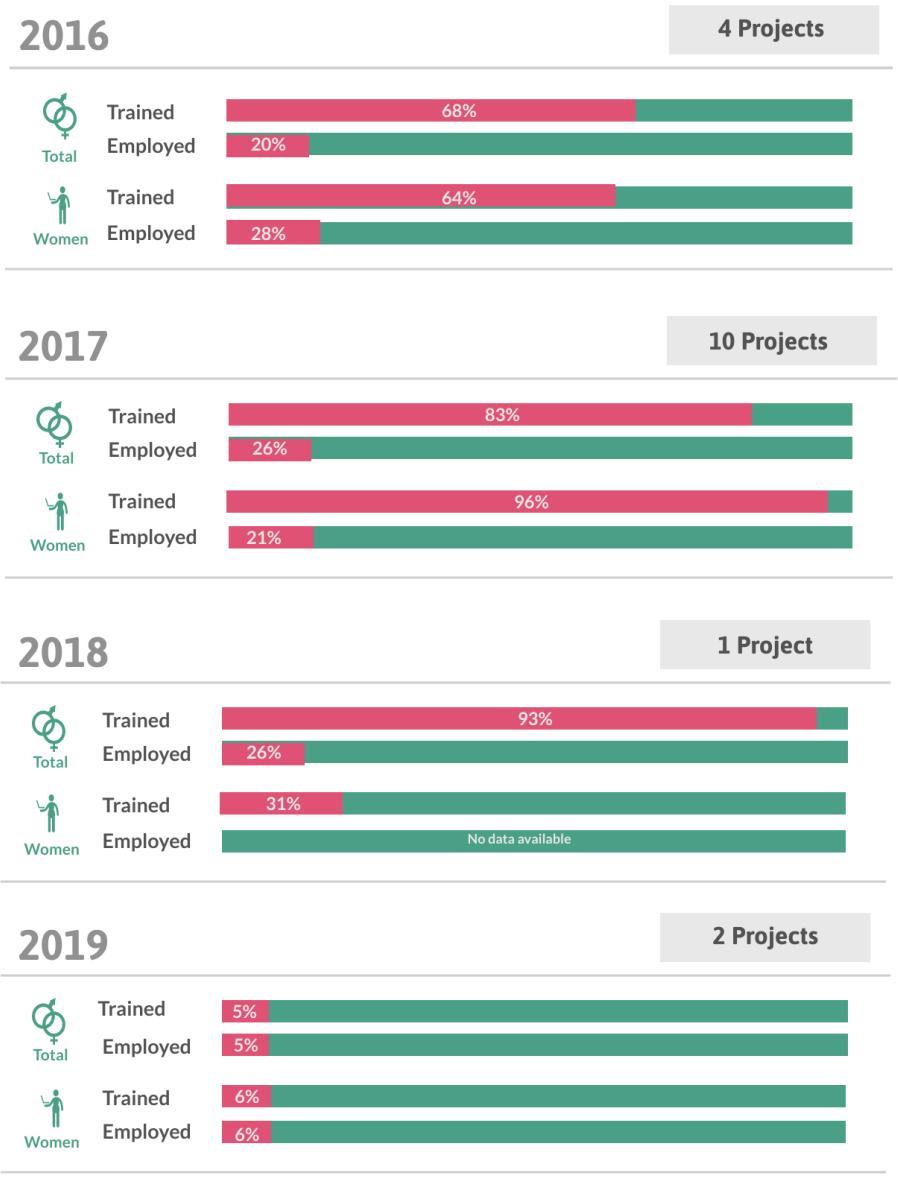
At the project level, **seven of the 18 projects have either achieved their target number of young people trained or are close to reaching it, and this includes many projects that started in 2017** (JaqueMate, Bolivia; NEO, Brazil; UpSocial, Chile; La Bola de Cristal and Generando Capacidades, Costa Rica; Laboratoria, Peru; Jovenes a Programar, Uruguay); six are between 40% and 60% of their targets (NEO, Chile; BIS, Colombia; Laboratorio de Innovación Territorial and IDC, Dominican Republic; Valentina, Guatemala; and EmpleaTech, regional).

Only three projects are below 20% of their target number (IncluTech, Argentina; Digitalización de la Fuerza Laboral, Mexico; and The Back Lot, Suriname). The project in Suriname experienced delays in starting the training because the building where the classroom is housed was not repurposed on time. However, the training with the first cohort started a few weeks before this report was prepared, and the organization was confident that it would be able to achieve its target. (See Figure 16 for the progress of projects toward target numbers of young people and young women trained and employed, by project and year of funding.)

The progress toward achieving training target goals for women was slightly lower for four of the projects reporting gender-disaggregated data. As we detail in Section 2.3, women face additional challenges that, in many instances, hampers their ability to participate and successfully graduate from training and educational

programs. Issues related to safety, family responsibilities, and social and cultural norms limit their educational and career choices. For young women living in conditions of vulnerability, the main population targeted by the projects, these issues are exacerbated, requiring programs to **implement purposeful gender equity strategies to attract, retain, and help women graduate and continue on a career path.** This discussion includes a description of the most relevant strategies implemented by the organizations to mitigate women's desertion from the programs. It also details the lessons learned to inform project design and implementation to improve the likelihood of gender equality in training and employability programs.

Figure 15: Combined progress toward targets of young people trained and employed, by year



Notes: Figures show progress against targets from the project start dates until the latest available data (June 2019). The majority of the projects with gender-disaggregated data set training targets of 50% of young women, with the exception of IncluTech (Argentina) and Valentina (Guatemala), which set targets of 30% and 65%, respectively.

No employment-related data was available for five projects, including NEO, Brazil; NEO, Chile; UpSocial, Chile (targets primary students); Technology & Sports, regional (project started in early 2019); and The BackLot, Suriname (training program was ongoing at the time of the study).

Source: IDB Lab Project Progress Reports, June 2019, for progress achieved until date; and projects' donors memoranda, indicators matrix, for targets per country.

Figure 16: Progress of projects against target numbers of young people and young women trained and employed, by year of funding.

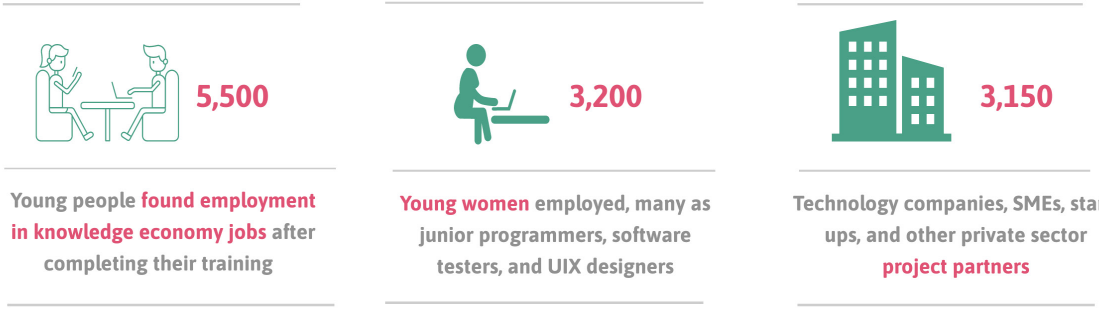
Notes: See [26] for additional information on the analysis of training and employment data

Source: IDB Lab Project Progress Reports, June 2019, for progress achieved until date; and projects' donors memoranda, indicators matrix, for targets per country.

2.2 After completing the training programs, 5,500 young women and men were employed

Employment outcomes are still emerging, because most of the projects started only three years ago and the training programs are still in progress. Additionally, it is important to consider that employment outcomes are dependant on a variety of external factors that are beyond the organizations' control, including the behavior of the economy in different countries, and the availability, quality, and relevance of jobs for young people who participate in the training programs. However, among the projects reporting employment progress, data shows that 5,500 of the young women and men who participated found jobs after completing their training — reaching 20% of the combined overall target thus far. (See Figure 14: Combined progress against targets for young people and young women trained and employed by year.) The total employment numbers for young women present a hopeful early picture of progress, with 3,200 finding employment after the training. (See Figure 17 for a summary of employability outcomes between 2015 and 2019.)

Figure 17: Summary of employability outputs and outcomes, all IDB Lab Future of Work projects, 2015-2019



Notes: No employment-related data was available for five projects, including NEO, Brazil; NEO, Chile; UpSocial, Chile (targets primary students); Technology & Sports, regional (project started in early 2019); and The Back Lot, Suriname (training program was ongoing at the time of the study).

*Data on young women employed represents mostly outcomes reported by six projects: Laboratoria, Peru (992); BIS, Colombia (589); Bola de Cristal, Costa Rica (522); Habilidades para el Futuro, regional (492); Valentina, Guatemala (114); and Jovenes a Programar, Uruguay (100)

Source: IDB Project Progress Reports, 2019, and interviews with representatives from selected projects (6)

These numbers, however, are mainly driven by the results of six projects in the portfolio, one of which has four years of experience training and finding better employment opportunities for women (Laboratoria, Peru). The other four projects include Valentina in Guatemala; La Bola de Cristal in Costa Rica; BIS in Colombia; Jóvenes a Programar in Uruguay; and Habilidades para el Futuro, a regional program in Argentina, Chile, Mexico, Peru, and Uruguay. (See Figure 15 for the progress of each project against employment targets.)

2.3 Lessons learned in key areas affecting project design, implementation, and sustainability

There are several factors that affect the progress, outcomes, and long-term viability of projects in the portfolio. This section outlines six of these overarching factors: 1) political landscape of the countries; 2) connectivity infrastructure and technical resources; 3) capacity, interest, and commitment of partners; 4) job placement strategies; 5) student entry, retention, and success in the training program; and 6) business model. This overview presents these factors in relation to their relevance to the design, implementation, and sustainability of a project. However, in reality, they have a cross-cutting impact, as the issues that affect project design have knock-on effects on project implementation and, in the process, also have implications for project sustainability.

1. Political landscape and institutional dynamics

Bureaucratic processes, political games, and institutional resistance to innovation often present significant obstacles to project implementation. Changes in the political landscape can affect the commitment and focus of public-sector partners, with implications for project design, implementation, and sustainability. For instance, alliances built during the inception of projects may dissolve as a result of changing government priorities and agendas; resources initially earmarked for the initiative might be redirected to other programs; labor strikes and other forms of civil unrest can disrupt training programs, leading to project delays and failure to achieve training targets; and projects can face resistance to innovation in school settings.

Design	Implementation	Sustainability
• When establishing alliances with the government, carefully examine the political environment to understand processes, procedures, relationships, and potential changes that could affect the project.	• For projects using BIS (Social Impact Bonds), the capacity of government entities could be improved by designing sequential bonds with the same public actor to take advantage of learning curves and transaction costs, and to leverage existing capacity.	• Based on an understanding of public- and private-sector contexts, develop mechanisms to foster a culture of learning and innovation, especially within the public sector.
• Avoid tying all project objectives to a single government program.		• Maintain clear communication and nurture ambassadors (such as teachers, parents, and tech industry leaders) to ensure that knowledge of the benefits of the project carries over through leadership changes.
• Establish diverse alliances (e.g. national government, local authorities, private sector) to avoid excessive dependence on the goodwill of the national government.		• Develop plans to support participants whose progress is disrupted by political developments.

Almost 10,000 young people received training, career guidance, and job placement services through the NEO program in Chile

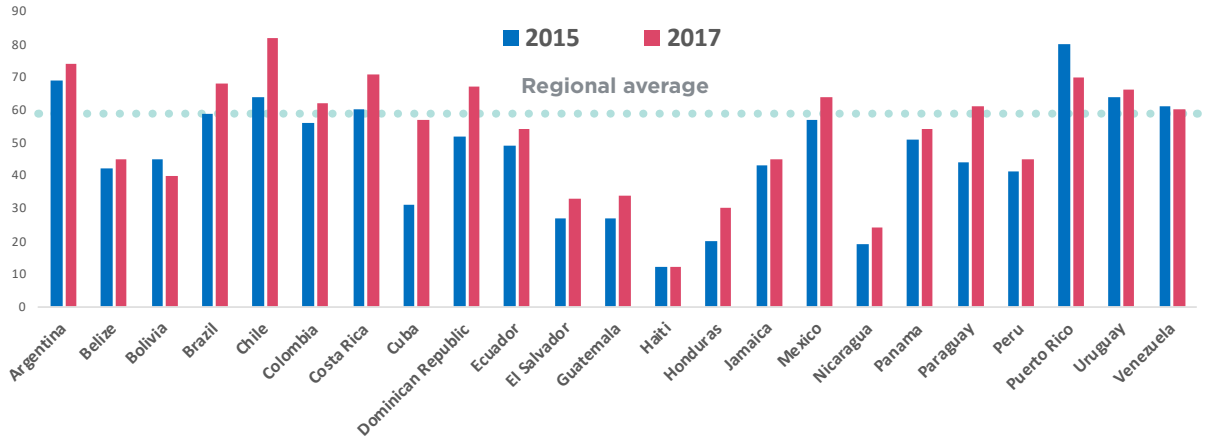
Source: NEO, Chile

2. Connectivity infrastructure and technical resources

The quality of internet infrastructure, as well as the availability of appropriate technical resources (equipment and human), can affect the reach and effectiveness of a project. Projects may experience delays due to the need to bring project sites to the necessary level of e-readiness (setting up infrastructure, retrofitting buildings, etc). Rural locations in particular tend to have limited classroom space, old equipment, and unstable connectivity, and frequently face technical problems that prevent regular access to the internet. There is also a lack of staff with the appropriate technical skills to provide training.

Design	Implementation	Sustainability
• Work closely with actors responsible for connectivity and with the technical advisors at the very early stages of the platform development and design. Adjust the design to the country's connectivity level.	• Implement hybrid models (e.g. online learning with physical presence, or computer centers with mobile schools).	• Start training activities in existing structures that offer technology access and connectivity. For example, develop agreements with companies that can open up computer labs to trainees, and to the formal educational system for training spaces. Also, consider public libraries as potential partners for technology training spaces.
• Hire an internet service provider with good connectivity.	• Develop training tools that are consistent with the technology that young people already use and do not always require high bandwidth to access and use.	
• Explore solutions that do not require a constant internet connection or that can work with low bandwidth.		

Figure 18: Percentage of internet users in Latin America and the Caribbean, growth from 2015 - 2017.



Source: ITU, 2018

3. Capacity, interest, and commitment of partners

All programs are heavily dependent on partnerships. Strong and effective partnerships can facilitate project success; on the other hand, partnerships can present challenges. Well-resourced partners, such as private-sector organizations, may misunderstand project objectives or be relatively uninterested in the core project goals. This can lead to lackluster participation or failure to meet obligations. Under-resourced partners, such as public schools, may be unable to participate due to challenges such as limited funds, poor connectivity and technical resources, lack of space, and distance from training sites. Educational institutions and teachers may be reluctant to adopt new technologies and training methodologies or to subject themselves to project evaluation processes. Differing organizational standards could lead to reputational damage for implementing agencies.

Design	Implementation	Sustainability
• Develop tools to assess partners before building alliances and coordinate closely with all partners to generate and maintain commitments. • Develop tools to monitor partner obligations.	• Renegotiate contract terms as necessary to adjust expectations and objectives	• Strengthen the capacity of training partners.
• Develop awareness programs to sensitize different partners and frontline actors to the need for and benefits of the project activities		
• Establish incentives for instructors (e.g. best teacher awards).		

4. Job placement strategies

The path from digital skills training to gaining employment is not straightforward. Amongst other things, projects have found that jobs may not be available, employers are often not interested in hiring program graduates, and graduates may not have the skills specific employers are looking for. Job creation and the labor market can be adversely affected by a slow economy and reduced levels of foreign direct investment that impacts commercialization and consumption of products. Rural areas in particular generally lack employment opportunities. Challenges may be encountered if private-sector employers perceive program graduates as unsuitable for employment due to their relatively low levels of education and lack of work experience. Even where employers participate in the programs, hiring processes may be slow and burdensome. Considering the scale of unemployment, it can be difficult to secure the number of alliances needed to provide job opportunities or internships for youth. Despite good intentions, training programs and internships do

not always prepare young people with the skills that employers are looking for. On the other hand, projects may also fail to provide the types of job opportunities that young people are interested in. Entrepreneurship development programs can face the additional obstacle of inability to secure investors for startups. Public entities and companies are often unwilling to share data and relevant information for the development of innovations and entrepreneurial activities.

Design	Implementation	Sustainability
• Projects with job placement objectives need to have dedicated job placement teams with experience and understanding of the industry.	• Partner with actors that offer technical and professional training programs that are already recognized in the market.	• Follow up with graduating students to better understand employment pathways and adjust programs accordingly.
• Monitor foreign investment trends to identify areas of opportunity.	• Be aware that technology jobs are available in both tech and non-tech organizations.	• Implement solid monitoring and evaluation systems after the initial phases of the projects to identify areas of improvement and implement strategic changes as the projects progress.
• Build strong and transparent relationships with potential hiring companies and career counselors, as well as hiring experts to work with youth.	• Ensure job opportunities are aligned with the interests of participants.	
• Align programs with demands in the labor market.	• Place students in jobs as soon as possible after graduation.	
• Establish relationships with companies that work in rural areas.		
• Raise seed funding through sponsors and crowdfunding efforts.		
• Educate financial intermediaries and investors to increase the array of financing possibilities for entrepreneurs.		

5. Student entry, retention, and success in training programs

Despite being designed to provide useful skills to disadvantaged youth, programs still face challenges in attracting and retaining students. Projects need to identify the right caliber of students even as they target populations that may be relatively unprepared to demonstrate the required aptitude. Attracting women and youth from low-income backgrounds is a particular challenge due to a lack of interest or inability to participate. Activity locations and timing may be inconvenient depending on people's area of residence or other life responsibilities. The challenges young people often face are complex and can be barriers to successful program completion. In addition, the payment-by-impact model of some programs incentivizes service providers to work with easier-to-reach populations rather than more vulnerable target groups. Attempts to introduce objectivity through the use of algorithms for student selection may become counterproductive as the algorithms discriminate against certain populations with lower education levels.

Design	Implementation	Sustainability
• Run robust awareness and communication campaigns among different target groups (e.g. career counseling, company visits, seminars/talks, role models, etc.).	• Identify the optimal training length to mitigate attrition.	• Include platforms with technical training combined with English, and transversal skills to make this type of project scalable and sustainable, and to make the training more relevant to young people.
• Conduct awareness and motivational campaigns to increase participation and interest among women and educate employers on gender issues.	• Find a balance between performance, interest, and aptitude when awarding scholarships for program participation.	• Implement solid monitoring and evaluation systems after the initial phases of the projects to identify areas of improvement and implement strategic changes as the projects progress.
• Improve the student selection process to mitigate attrition (e.g. incorporate student pre-testing to predict performance).	• Make training schedules compatible with youth schedules, and consider the safety of locations and public transportation routes. This is particularly important for women.	
• Include training methodologies and tools sensitive to gender, ethnicity, race, disability, etc.	• Maintain constant communication and progress reports to help students complete the course.	

6. Business model

Digital training projects that are initiated with donor funding invariably have to contend with determining how to sustain their activities after donor funding runs out. Standard business models such as student fees, employer fees, or development of commercial enterprises are not always effective when targeting low-income populations or low-resource areas. Program participants may be unable or unwilling to pay required fees. Low use of program platforms limits the success of monetization strategies. Employer fees can only be obtained if employers are willing to hire, and business incubators may have difficulty finding investors.

Design	Implementation	Sustainability
• Ensure all project elements are provided for in the counterpart's financial contribution (e.g. awareness-raising activities, training of the implementation team).	• Improve the process of disbursing funds approved for the projects, from IDB as well as from counterparts. Delays in disbursing funds constrain the ability of organizations to implement projects in a timely manner.	• Consider creating a social enterprise that can raise funds using different financial instruments. Two tools that are currently being tested are Social Impact Bonds (BIS) and investment funds using convertible notes.
• Build a community of committed donors.		• Be sure to look for capital that seeks a return on investment in at least 10 years and focuses on impact, not profits.
• Projects that raise funds through student fees need to improve their payment process upon graduation. Consider partnering with micro-financing institution that can manage the process.		

Other relevant considerations include the need for projects to develop realistic objectives, targets, and timelines; continuous monitoring, evaluation, and environmental scanning in order to change course if necessary; strong awareness-raising programs; and the identification of innovative and appropriate training formats to enhance participation and success rates. While the factors outlined here are important to individual program design and implementation, the next section consolidates the observations into high-level recommendations for institutions seeking to invest in this type of employability-oriented skills training initiative.

Recommendations

1. BALANCE EMPHASIS ON EMPLOYMENT IN BIG TECH FIRMS WITH SUPPORTING PATHWAYS TO ENTREPRENEURSHIP AND JOBS IN THE PUBLIC SECTOR

Projects in the portfolio focus almost exclusively on creating pathways to employment in large technology firms in the private sector. Few give consideration to the public sector as a relevant employer for people with basic and advanced digital skills. The evolution of the portfolio points to a continuation of this trend. Yet project implementing agencies also note that the large private firms have been slow to absorb program graduates, whether with internships or full-time jobs. To address this:

- Continue working with SMEs and start-ups that have more flexible hiring processes for young talent.
- Identify the underlying reasons why large technology companies are not hiring program graduates and determine whether the reasons can be meaningfully addressed.
- Recognize the hiring potential of the public sector, considering the extensive digital transformation under way in the public sector. Identify the job skills needed in the public sector. Allocate resources to new programs targeting jobs in public agencies.

It is encouraging that some programs are exploring the potential for employment and job creation in SMEs and start-ups. However, Latin America's culture of seed funding and investment is still in its infancy. As such, there is very limited seed funding to develop entrepreneurship opportunities. To address this:

- Incorporate funding for start-ups into the budgets of programs that seek to encourage entrepreneurship. IDB could consider funding not only the creation of innovation hubs but actual investment in entrepreneurship opportunities.

2. CRITICALLY ASSESS THE IMPLICATIONS OF DIFFERENT TRAINING APPROACHES FOR DISADVANTAGED POPULATIONS

A few programs have tested traditional and blended training modalities and generally found that programs that include some facetime with instructors are more effective. There is some indication that when programs are primarily self-directed, there is lower success in training outcomes, student retention, and job placement of students from disadvantaged socioeconomic backgrounds. The reasons for this are unclear and likely to be the result of a confluence of structural and personal factors. To address this:

- Perform deeper analysis of the projects that experimented with different training approaches to obtain evidence (if any) of the relative effectiveness of different approaches for different target populations.

- Develop approaches that take into account the unique historical conditions that encircle people from low socioeconomic backgrounds.

3. ARTICULATE CONCRETE STRATEGIES FOR TARGETING WOMEN FOR TRAINING, AND CONDUCT RESEARCH TO UNDERSTAND WHY WOMEN DO NOT PROGRESS TO MORE ADVANCED PROGRAMS AND/OR EMPLOYMENT

Analysis of project descriptions and progress reports shows that all projects include a goal to increase women's participation in digital skills training programs. However, most do not clearly articulate exactly how they will identify and address the barriers that inhibit women's participation, nor do they provide clear mechanisms to measure the levels of participation. Even when women do participate in programs, it appears that while they equally complete courses with good grades, and equally obtain program scholarships, they often fail to move on to more advanced courses. The reasons for this are unclear; most interview respondents had some hypotheses but no evidence-based knowledge. To address this:

- Project implementing agencies should indicate concrete strategies for attracting and retaining women participants. Strategies should go beyond the obvious or superficial to consider the complexities of engaging women. For example, programs should account for safety issues that inhibit women from participating in programs held in certain locations and at certain times.
- Undertake studies to understand the root causes of why women drop out of programs, especially at the more advanced levels, and do not access employment opportunities.

4. PURSUE A MORE EQUITABLE DISTRIBUTION OF PROGRAMS IN URBAN AND RURAL AREAS

Programs are largely serving urban communities. This runs the risk of further increasing the digital and economic divide between rural and urban areas. Notwithstanding the constraints in rural areas (poor connectivity quality, lack of job opportunities, limited transportation options), programs should be developed for youth in these regions. To address this:

- Design and implement programs specifically for rural areas or in ways that enable rural youth to participate.
- Be sensitive to reward systems that motivate programs to mostly target easy-to-reach populations in urban areas.

5. RECOGNIZE THE CRITICAL ROLE OF THE SOCIAL AND CULTURAL CONTEXT TO ASSESS PROGRAM OUTCOMES.

The most well-designed training programs will still have limited success if the socio-cultural environment inhibits opportunities for disadvantaged and vulnerable populations. Evidence from the examined projects points to the possibility that some of the barriers are linked to negative perceptions of the employability of people from poor socioeconomic backgrounds. Efforts to achieve gender parity in program participation and employment outcomes is compromised by invisible barriers that stunt opportunity for women and girls. To address this:

- Advocate for reform of the education system to provide higher-quality, more equitable opportunities to people of all socioeconomic standing. Support the development of curriculum that is responsive to the changing nature of technology and the job market.
- Campaign for gender equality in all aspects of social and economic life. Challenge other socially constructed norms that disadvantage different populations.

6. INSTITUTE CLEARER REPORTING MECHANISMS

Project descriptions and progress reports contain a lot of useful and relevant material for understanding and monitoring the progress or projects. However, there are some gaps that, if filled, will support better project monitoring and evaluation against key project agendas. For instance, despite the gender-specific goals of programs, most do not collect gender-disaggregated data. To address this:

- Identify key expected outcomes that cut across projects, and maintain consistent reporting formats for those outcomes. Communicate clear expectations to avoid the tendency to phrase targets very loosely. This can be pursued by selecting a set of key indicators for which all projects are required to collect data.
- Ensure disaggregated data is collected for populations of interest (including women, rural youth, etc.).
- Collect detailed information on the training program, once it is designed and ready to implement, to better assess its effectiveness in educational and employment outcomes
- To strengthen the reliability of progress reports, include assessment by independent evaluators as part of projects' monitoring and evaluation processes.
- Leverage the collective intelligence reported by the executing agencies in the progress reports' lessons learned, and create a space where different organizations can exchange valuable information and learn from each other.
- Along these lines, consider organizing two calls a year, shortly after progress reports are due.

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Endnotes

1 OECD, 2017

2 ILO, 2019

3 (ibid)

4 OECD, 2017; UNESCO, 2017; and ILO, 2019

5 Nübler, 2017

6 Herranz, 2017

7 Busso, et al., (eds.), 2017

8 Manpower, 2015

9 CISCO, 2016

10 Castillo, Grazzi, & Tacsir, 2014

11 IDB, 2012

12 See for example: Mateo-Diaz & Rucci, 2019

13 Garrido, et al., 2016

14 According to Course Report, an organization that monitors coding bootcamps, there are 67 coding bootcamp providers in the U.S. and Canada alone. They graduate 16,000 students a year, 75% of whom found full-time jobs, averaging a 44% increase in salary. See: Course Report, 2018

15 Defined as the number of industrial robots per 100 manufacturing workers. In Nübler 2017

16 (ibid)

17 As of October 29, 2018, IDB Lab (www.idblab.org) is the new identity of the Multilateral Investment Fund.

18 New Employment Opportunities for Youth Initiative and Youth Entrepreneurship Program.

19 Two of the projects in the pipeline were approved in November 2019 (Google.org and Telefonica.org).

20 For a thorough analysis on the importance of socio-emotional skills to succeed in the knowledge economy labor market, see Mateo Diaz & Rucci (eds.), 2019.

21 See for example: Trucco, 2014; Gamboa & Kruger, 2016; UNESCO Global Education Monitoring Report, 2015, 2016, 2017; Mateo Diaz & Rucci, 2019; and Kang & Paus, 2019, among others.

22 UNESCO, 2017a

23 For a thorough analysis of gender digital inequality around the world, see Sey & Hafking (eds.), 2019.

24 CEPAL, 2019

25 ILO (2017); Thomas, Dougherty, Strand, Nayar, & Janani (2016); Gompers & Wang (2017); Hunt, Yee, Prince, & Dixon-Fyle (2018).

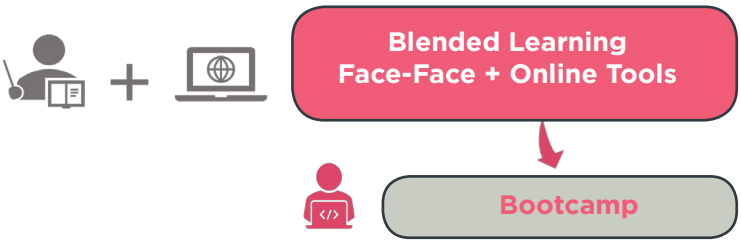
26 Figures show progress against targets from the project start dates until the latest available data (June 2019). The majority of the projects with gender-disaggregated data set training targets 50% of young women, with the exception of IncluTech (Argentina) and Valentina (Guatemala), which set targets of 30% and 65%, respectively. No employment-related data was available for five projects, including NEO, Brazil; NEO, Chile; UpSocial, Chile (targets primary students); Technology & Sports, regional (project started in early 2019); and The Back Lot, Suriname (training program was ongoing at the time of the study).

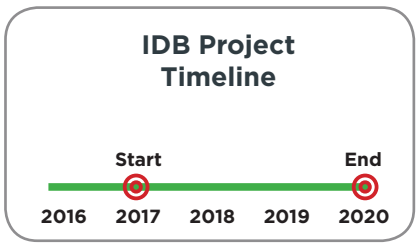
Plan Ceibal

Jóvenes a Programar

Uruguay

Objective: Increase the availability of qualified human capital for the software industry and facilitate the transition of young women and men from education to the labor market.





The Context

With a booming $1.2 billion USD IT industry, Uruguay has positioned itself as the leading software exporter per capita in South America, and No. 3 in the region in absolute terms. The industry is expected to double its software exports by 2020, but its growth could be hampered by a lack of qualified talent to fill more than 10,000 jobs it is expected to create in four years.

Description of the project

In response to this challenge, Jóvenes a Programar (JAP) designed a bootcamp-style training and job readiness program to equip young women and men (17-26 years old) with the programming, socio-emotional, and job skills needed to improve their employment opportunities in the software industry and promote lifelong learning.

Training approach

- **Participants are selected through an open admissions process**, in which JAP administers an initial test to assess aptitude, motivation and commitment to complete the training. Each admitted student gets a loaned laptop and the training program is free of charge.
- The training is based on **agile learning methodology** with students participating in 10 hours of training a week for six months (6 hours working in teams face-to-face and 4 hours of work using online learning tools). The training program has two phases:
  - **First phase** focuses on building programming, socio-emotional, and English skills. **The second phase** focuses on job preparation and job placement.

Trainers and curriculum development:

- **Technical training:** Company partners contribute with technical trainers and participate in curriculum development, informing the types of programming skills that are demanded in the market.
- **Soft, language and job skills:** CEIBAL trainers manage the component of socio-emotional skills, English language and job counseling.

Project outcomes as of June 2019

Trained	Employed	Partnerships
1,463	316 youth	400 companies
458	32 women	7 government

Innovative strategies

Women's participation and retention in training programs:

- JAP **offers transportation support and provides day-care services** to facilitate the participation of women in training sessions that require a physical presence.
- **Partnering with supporting organizations** working on issues of domestic violence, homelessness, safety, etc. to better understand the realities of women and offer a more comprehensive program.
- Hiring **trainers who are knowledgeable of gender approaches** to teaching and learning to create a more enabling environment for women.

Model for company engagement:

- Creating **working groups with the Uruguayan Chamber of Information Technologies** (CUTI, in Spanish) and the tech industry to jointly develop the technical training that constantly changes based on market needs.

Monitoring and Evaluation System

- JAP has a **solid M&E system** that allows the organization to implement and test different training models and assess outcomes of the program while identifying areas for improvement.

Challenges

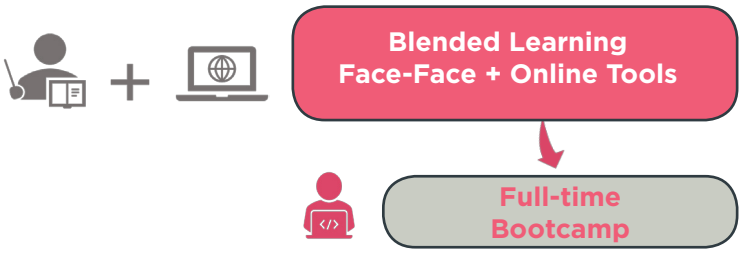
- The certificate young people obtain from the program is not validated by the formal educational system, and thus is not helpful for students interested in continuing their education.
- Companies' hiring processes for junior talent still need a lot of reform; they delay the job insertion component of the program.
  - JAP is diversifying its employer partnerships to include small companies and startups— where hiring processes are more flexible and less costly — and also the public sector.

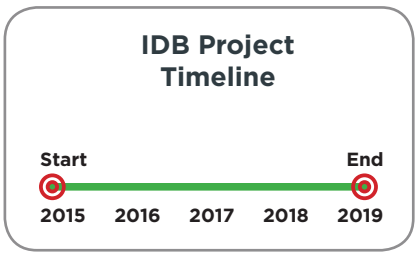
Source: -Jóvenes a Programar

‹ Laboratoria ›

Peru

Objective: Strengthen the transition from school to STEM disciplines, particularly to informatics and systems engineering, and to employment in the software industry..





The Context

Despite considerable progress in the past two decades, women remain significantly underrepresented in STEM education and in STEM-related occupations all over the world. According to UNESCO, women represent on average 30% of the STEM student body in higher education, and only 25% of the STEM labor force worldwide. In Peru, where less than 10% of the software development workforce are women, lack of access to quality education and social prejudices and stereotypes deter many women from pursuing technical careers in a sector hungry for qualified talent.

Description of the project

Laboratoria **is a social enterprise that designed an innovative full-time bootcamp program** to prepare low-income women to pursue careers in the technology sector. The organization started its operations in Peru five years ago and has expanded its training program to many countries in Latin America, including Chile, Brazil, Mexico and, most recently, Colombia. It has expanded its initiative and efforts to **diversify technology company teams** and is now running diversity and gender equity workshops tailored to sensitize leaders in the industry.

Training approach

- The **training is designed as a full-time bootcamp** that has a duration of six months of intense training, focusing on women who either didn't finish university studies or finished but received a poor quality education. Most of the women participating in the bootcamp worked in the informal economy or were underemployed before joining the training.
- Laboratoria has a **rigorous and strict student selection process and a low acceptance rate**, focusing its selection on students who show technical talent potential and ability to self-learn. Prospective students go through a series of tests and an interview process.
- Laboratoria trainers design the modules and constantly revise and adapt the contents to market needs. **The training is based on agile learning methodologies,** embedding socio-emotional skills in all aspects of the program.
- Recently the organization has also **targeted the demand side**, designing workshops that train company leaders on issues of diversity, gender equity and the need to

change the process of hiring junior talent. This emphasis on nourishing a transformation of companies' cultures to become more welcoming to women working in technical positions is critical for the success and sustainability of the project.

- Laboratoria **graduates face challenges when they join the workforce** — sometimes they are the first women in technical teams — and have to face a lack of diversity culture in companies. Sometimes, they are put in jobs that are not related to technology development even though they are fully qualified to do the job.

Project outcomes as of June 2019

Trained	Employed	Partnerships
1,200	992 women	+250 companies

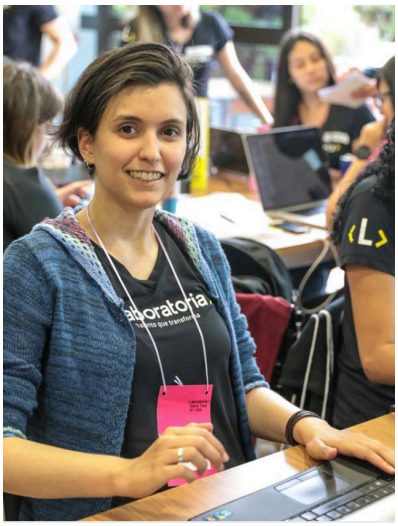
Innovative strategies

Transforming companies' cultures

- During the first phase of the project, it focused on the supply side of talent. Now it also wants to work on the demand — on companies' cultures in their process of digital transformation. It is not only about adding technology to a company's process. It is about **changing the culture — especially leadership culture — of companies**.
- Many of the **workshops in companies relate to gender diversity and equity,** respect for human rights and people's choices. Laboratoria also offers three additional months of coaching to leaders as they implement the changes in their organization.

Challenges

- Difficulty achieving sustainability due to the characteristics of the population. The model needs additional time to sustain itself because the women who join the program often incur debt while participating in the bootcamps and need time to repay the cost of the training. Also, many become the main breadwinners for their families and are charged with additional financial responsibilities. Laboratoria hasn't found a way to recoup payment in a timely manner and doesn't want to overstress its graduates.
  - Laboratoria tried the hiring fee model, but it didn't work. It is very difficult to get companies to pay a hiring fee for junior talent.
- Laboratoria is looking for other sources of revenue, such as company fees for TalenFest and Hackathons, and paid company leadership workshops.

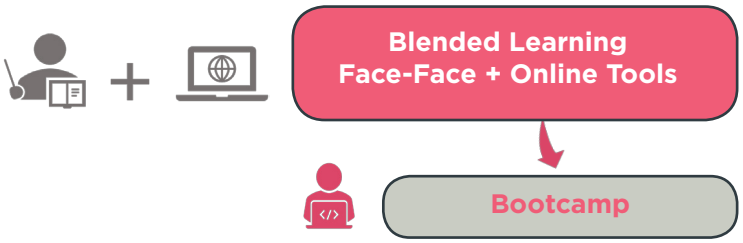


Source: Laboratoria

PROGRAMA VALENTINA de Funsepa

Guatemala

Objective: Equip Guatemalan at-risk youth, primarily women and indigenous young people, with the skills needed to place them in knowledge-based formal jobs that offer decent salaries and career paths.



The Context

Despite a moderate reduction of extreme poverty rates in the past five years, Guatemala still suffers from pervasive economic and social inequality that particularly affects women, at-risk youth, and people living in rural areas. Key factors exacerbating inequalities and a lack of opportunity for young people include unequal access to quality education and decent jobs; high rates of violence and citizen insecurity; and high migration rates of young people to the United States. These factors contribute to Guatemala's 27% rate of young people who are not in employment, education or training, among the highest in Latin America.

Description of the project

The Valentina Training Centers provide training in computer literacy, productivity tools, and socio-emotional and job skills for low-income urban and rural youth to improve their employment opportunities in the knowledge-based industry. With a particular emphasis on young women, the project expects to increase the number of women hired by technology companies and contribute to narrowing the salary gender gap, while addressing the shortage of qualified labor that significantly affects the industry's growth.

Training approach

- **Candidates for the Valentina program are recruited through social media** and asked to register online. They then complete a psychometric test online to assess their ability to self-learn, along with their values and ethics. The organization further assesses interest in the program with an interview. **Only 1 in every 5 candidates is accepted.**
- The **training is designed with a bootcamp-style, project-based approach** intended to replicate the work environment, with students working on different weekly projects provided by company partners from different sectors (health, retail, telecom, etc.).
    - Using a blended-learning methodology, the students meet face-to-face for a portion of the training and participate during 3 hours a week in online courses complementing their learning.

Type of skills and curriculum development.

- Training is **focused on learning productivity tools** (Office, Google Suite) to prepare students for junior-level office management positions. Socio-emotional and job skills are a transversal component of the training program.

- Students receive a Valentina Certificate after completing 180 hours of training over three months. Once students graduate from the program and find a job, they pay a monthly fee for 3-6 months to cover the $400 cost of training.

Project outcomes as of June 2019

Trained	Employed	Partnerships
732	249 youth	74 companies
368	114 women	5 government

Innovative strategies

Women's participation and retention in training programs

- Valentina set a target of 65% women graduates — among the highest in the IDB Lab Future of Work Portfolio — but it was only achieving 52% of its original target. As part of a strategy to recruit more women, the organization developed a **communications campaign using more friendly language,** emphasizing the types of skills women could gain and the types of jobs available to them.

Reaching out to indigenous youth and rural areas

- Through the **satellite Valentina training centers,** the organization is able to reach at-risk and indigenous youth in rural areas. Similar to the challenges women face, in rural areas it is very difficult and expensive to get transportation for the training. Job opportunities also are not as available as in urban areas.

Emphasis on finding decent employment in the formal economy

- One of the most innovative elements of the Valentina training program is an **effort to place its graduates in decent jobs that offer good salaries, benefits and a possibility for a career path**. The emphasis on decent employment is a key element of the program and determines, to some extent, the nature of partnerships with potential employers.
- As part of this effort, the organization has placed a special emphasis on **partnering with small and medium enterprises (SMEs),** which has considerably increased the job placement rate for program graduates.

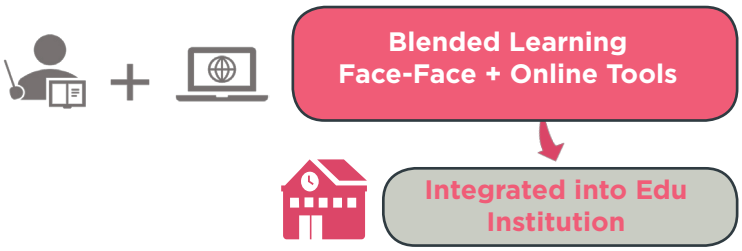
Challenges

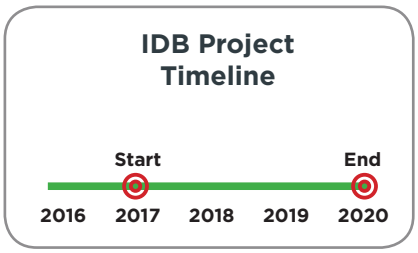
- Job opportunities in rural and semi-rural areas are not as prevalent as in urban areas. In addition, the informal economy that drives employment opportunities and hiring practices in the interior of the country poses a challenge for the organization's efforts at finding decent jobs for its graduates outside urban centers.
- The program has difficulty collecting student monthly fees after they graduate and find employment. The organization faces a 30% rate of delayed payments and is considering a partnership with a micro-financing company to help it manage the collection process.

Jaquemate
educación por razonamiento

Bolivia

Objective: Strengthen young people's transition from school to STEM disciplines, particularly to informatics and systems engineering, and to employment in the software industry.



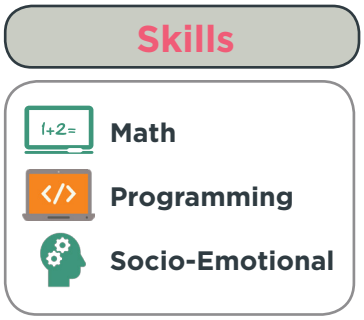


The Context

During the past 15 years, the software industry has experienced considerable growth in Bolivia, with the city of Cochabamba as its epicenter. The most important source of human capital for the industry is universities, particularly informatics and systems engineering graduates. However, the country's educational system has historically suffered from low achievement in math, leading to a lower number of students who pursue and graduate from STEM disciplines. This also affects the competitiveness of university students in the labor market.

Description of the project

Fundación Jala is working with teachers and students in more than 80 secondary schools to improve math, logical and computational thinking, and soft skills. Through its project Jaque Mate, the organization provides teachers with innovative methodologies and tools to help students strengthen foundational skills in early education that are key for facilitating their transition from school into STEM disciplines and potential career paths in the software industry.



Training approach

- **Jaque Mate created a train-the-teachers program based on materials and tools developed by Khan Academy,** an online platform that offers a set of tools to help students learn different subjects. Jaque Mate works with three types of educational institutions at the secondary level: public, charter and private schools. Its strategy is threefold:
    - It trains the **teachers (ToT) on tools and methodologies to improve math, logical and computational thinking for secondary students** in participating schools. Even though all teachers receive the same training, they have the freedom to use the tools they deem most appropriate for their students. The ToT is face-to-face.
    - The **students participate in guided sessions,** working with Khan Academy materials **three times a week in the school labs.** They also can access the platform online on their own to practice the sessions. Additionally, these sessions are complemented with workshops to strengthen socio-emotional and English skills.

- The **organization follows up with students for four years.** Those who excel in the training sessions are offered a scholarship to continue training in Fundacion Jala's basic programming courses. It also offers scholarships to university students so they have access to more advanced courses.

- Fundacion Jala's **trainers visit schools once a week to follow up with teachers and provide troubleshooting**. The organization is testing remote twice-monthly visits with its trainers and technicians, offering a new way to support teachers. With this new approach, the organization expects to reach more schools, particularly in rural areas where location access and connectivity are more limited.

Project outcomes as of June 2019

Innovative strategies

Flexible and adaptable methodology to reach scale

- **Develop a flexible methodology, with teachers' input,** that can be adapted to different contexts with good results — but not without challenges. The organization is currently working with more than 80 schools and 20,000 students, demonstrating that the methodology is replicable and scalable.
- **Rank schools to create healthy competition.** At one school ranked in the top three, a teacher who has embraced remote training is seeing direct benefits from using that methodology.
- Show an **ability to adapt to the challenges the organizations face training older teachers** in the Khan Academy platform. This is very important for scalability.

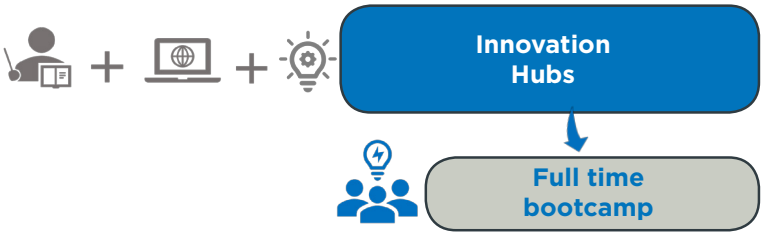
Challenges

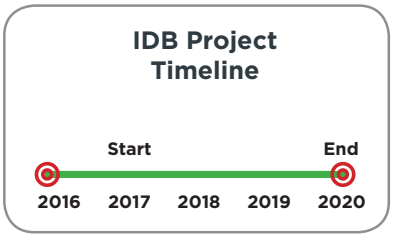
- Quality and cost of connectivity: Schools now have to finance internet access with their own resources. This represents a big challenge for public and charter schools. Khan Academy requires bandwidth if teachers use the videos. Some schools don't have enough computers, and many students have to use their cellphones to access the platform.
- A paradox in rural schools: Connectivity is particularly challenging in rural areas, where most of the teachers are young and willing to experiment with new tools and methodologies, but they are heavily constrained due to poor internet quality.
- Lack of awareness among young people of STEM career paths. This particularly affects women, who are socially discouraged to pursue systems and software engineer careers.
- Dependence on a third party for the methodology and tools. Fundacion Jala doesn't own the material, making it dependent on the changes Khan Academy implements in its platform.

Parque Cibernético Santo Domingo

Dominican Republic

Objective: Develop a training program to prepare the first cohort of interactive technology developers based on augmented and virtual reality (AVR) platforms and create entrepreneurship opportunities for youth based on frontier technologies.



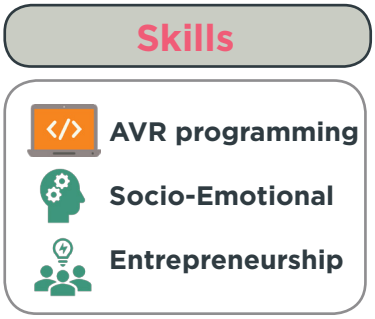


The Context

In the past 15 years, the Dominican Republic has made great strides to diversify its economy by investing in sectors such as in information technology and telecommunications. One of the country's biggest bets is in technologies and services related to the production of interactive digital content based on augmented and virtual reality (AVR), which is experiencing a surge in demand in the technology sector worldwide, particularly in its applications in education and sports.

Description of the project

The Interactive Digital Center's (IDC) main objective is to improve the availability of human talent to develop AVR technologies to elevate the country's position in the global market for frontier technologies. IDC partnered with EON Reality — a world leader in AVR technologies — to implement a training program to prepare the first cohort of developers specializing in applications and content development using AVR platforms.



Training approach

- **The training is based on EON Reality's curriculum, using agile learning and SCRUM**, an agile process framework for managing knowledge work. During the training program, students work in groups of 3-5, mixing programmers, designers and integrators (a new role that emerges from the group and helps integrate and coordinate the work between programmers and designers).
- The program is organized as a **bootcamp, with students participating in the training for 20 hours a week over 8 months at no cost.** After the first round of recruitment, potential candidates participate in interviews to assess their ability to understand technical issues, self-learning, motivation, etc. The program brings together two types of students:
  - Those with a technical background in programming and web development;
  - Graphic designers and artists with no background in programming.
- During the **first phase of the program, EON Reality trainers traveled to the country for 16 weeks to offer the training** to the first cohort of 30 students. Each trainer was responsible for a module every week, teaching students modeling, app development, and content development on AVR, among other subjects.

- The **second phase of the training focused on technology project management and on strengthening socio-emotional skills**. After this phase concluded, the most advanced students were selected to become trainers themselves

Project outcomes as of June 2019

Trained	Employed	Partnerships
43	28 youth	4 companies
18	8 women	3 government

Innovative strategies

Emphasis on developing advanced technical skills in frontier technologies

- This is the only project in the IDB Lab portfolio (2016-19) that offers a**dvanced digital skills training in AVR with a focus on the entertainment industry.** As a job placement strategy, program graduates have the option of working at IDC or developing their own entrepreneurial endeavors, which the Institute supports by opening up its ecosystem of companies and acting as an incubator to help them raise start-up funds.

Innovations in training and job placement

- IDC's training approach is unique in the mix of young talent that works together as a team during the program. **By mixing programmers and designers and artists,** it incentives a cross pollination of abilities in the teams, with designers learning basic programming and programmers learning basic principles of design.

Women´s participation in the program

- As a result of this training approach, **women have a lot of interest in the training program.** There is a gap in the share of women coming from programming backgrounds, but they are properly represented on the design side. For this reason, women can learn programming even though they don't come from programming backgrounds. AVR requires both types of profiles.

Challenges

- AVR is a very new technology and both private and public sectors are still unaware of the potential uses and benefits of incorporating this technology into their businesses.
  - There is still a nascent AVR culture in the country, and the biggest challenge for IDC is in raising awareness and interest in its multiple applications in the private and public sectors. This challenge affects both the sustainability and potential scalability of the project.
- Constraints in the number of students the Institute can train because of limited equipment (currently limited to 15 machines).
- Difficulty raising investments funds for the entrepreneurial ideas of the graduates.

Appendix 1: Categorization of the IDB Lab Future of Work portfolio and investments 2016- 2019

							Training elements				Employability elements					
	Project	Year	Country	Executing Agency	Technical coop. Total USD	Type of project	FS	DS	SES	ToT	Job Prep	Job Plac	E	CE	Target group(s)	Type of skills
1	Inclu-Tech	2017	Argentina	ARGECON	$2,398,000	Blended Learning ⇛ Part-time training			◎	◎	♣	♣			➢ Youth 16-29 ➢ Young women ➢ Teachers/trainers	➢ Socio-emotional skills ➢ English skills ➢ Train the trainers
2	Workana	Investment	Argentina	NA	NA	Self-directed learning ⇛ Online Platform							♣		➢ Available for all users working as freelancers	NA
3	JaqueMate	2017	Bolivia	Fundacion Jala	$1,200,000	Blended Learning ⇛ Integrated into formal educational settings	◎	◎	◎	◎	♣	♣		♣	➢ Secondary students ➢ University-Technical college students ➢ Young women ➢ Teachers/trainers	➢ Math ➢ Computational thinking Programming ➢ Robotics basic ➢ Socio-emotional skills ➢ Job skills ➢ Train the trainers
4	New Employment Opportunities for Youth (NEO)	2016	Brazil	Instituto Alianza	$8,702,616	Blended Learning ⇛ Integrated into formal educational settings		◎	◎	◎	♣	♣			➢ Youth 16-29 ➢ Young women	➢ Socio-emotional skills ➢ Job skills ➢ Train the trainers
5	New Employment Opportunities for Youth (NEO)	2016	Chile	Fundación - Universidad Playa Ancha	$8,920,927	Blended Learning ⇛ Integrated into formal educational settings		◎	◎	◎	♣	♣			➢ Youth 16-29 ➢ Young women	➢ Socio-emotional skills ➢ Job skills ➢ Train the trainers
6	Lab4U	Investment	Chile Mexico	NA	NA	Blended Learning ⇛ Integrated into formal educational settings	◎			◎					➢ Secondary students	➢ Basic Science
7	UpSocial	2017	Chile	UpSocial	$1,303,154	Blended Learning ⇛ Integrated into formal educational settings	◎			◎					➢ Primary students ➢ Teachers/trainers	➢ Math ➢ Train the trainers
8	Bonos de Impacto Social (BIS)	2016	Colombia	Fundación	$4,435,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9	Crehana	Investment	Colombia Mexico	NA	NA	Self-directed learning ⇛ Online Platform		◎	◎						NA	NA

							Training elements				Employability elements					
	Project	Year	Country	Executing Agency	Technical coop. Total USD	Type of project	FS	DS	SES	ToT	Job Prep	Job Plac	E	CE	Target group(s)	Type of skills
10	Generando capacidades para la nueva fuerza laboral	2016	Costa Rica	Fundación Monge	$3,474,000	**Blended Learning** ⇛ Part-time training		◎	◎	◎	♣	♣		♣	➢ Youth 16-29 ➢ Young women ➢ Teachers/trainers	➢ Programming ➢ Socio-emotional skills ➢ Job skills ➢ English skills ➢ Train the trainers
11	La Bola de Cristal	2018	Costa Rica	CINDE	$2,800,000	**Self-directed learning** ⇛ Online Platform		◎	◎		♣				➢ Youth 16-29 ➢ Young women ➢ Adults	NA
12	Interactive Digital Center (IDC)	2016	Dominican Republic	Parque Cibernetico de Santo Domingo	$7,227,420	**Innovation Hub** ⇛ Full time bootcamp		◎	◎	◎			♣		➢ Secondary students ➢ University students ➢ Tech college students ➢ Young women ➢ Teachers/trainers	➢ Programming AVR ➢ Entrepreneurial skills ➢ Train the trainers
13	Laboratorio de Innovación e Inteligencia Terr.	2017	Dominican Republic	INTEC	$1,685,000	**Innovation Hub** ⇛ Not available		◎					♣		➢ City inhabitants ➢ Entrepreneurs	➢ Data literacy ➢ Entrepreneurial skills
14	Valentina Program	2017	Guatemala	Fundación Sergio P. Andrade	$1,625,000	**Blended Learning** ⇛ Bootcamp		◎	◎	◎	♣	♣			➢ Youth 16-29 ➢ Young women ➢ Indigenous youth ➢ Trainers	➢ Productivity tools ➢ Socio-emotional skills ➢ Job skills
15	Acelerando la Digitalización de la Fuerza Laboral en el Sector Automotriz	2017	Mexico	Fundación Comunitaria del Bajío	$3,000,000	**Blended Learning** ⇛ Part-time training		◎	◎		♣	♣			➢ Secondary students ➢ University students ➢ Technical college students ➢ Young women	➢ Basic digital skills ➢ Socio-emotional skills ➢ Job skills
16	Dev.F	Pipeline	Mexico	Dev.F	NA	**Blended Learning** ⇛ Bootcamp		◎	◎		♣	♣			➢ University students	➢ Programming ➢ Job skills
17	Laboratoria	2015	Peru	Laboratoria	$2,090,000	**Blended Learning** ⇛ Bootcamp		◎	◎		♣	♣			➢ Women	➢ Programming ➢ Job skills
18	Creative Industries and Technology Hub	2017	Suriname	Stitching the Back Lot	$2,323,000	**Innovation Hub** ⇛ Part-time bootcamp		◎	◎				♣		➢ Youth 16-29 ➢ Young women	➢ Design & multimedia ➢ Socio-emotional skills ➢ Entrepreneurship skills
19	Jovenes a Programar	2017	Uruguay	Centro Ceibal	$7,277,985	**Blended iLearning** ⇛ Bootcamp		◎	◎	◎	♣	♣		♣	➢ Youth 16-29 ➢ Young women	➢ Programming ➢ Socio-emotional skills ➢ Train the trainers ➢ Job skills

							Training elements				Employability elements					
	Project	Year	Country	Executing Agency	Technical coop. Total USD	Type of project	FS	DS	SES	ToT	Job Prep	Job Plac	E	CE	Target group(s)	Type of skills
20	Laboratoria	2015 + 1 project in pipeline	Regional: 1. Peru 2. Chile 3. Mexico 4. Brazil 5.Colombia	Laboratoria	$2,089,939	Blended Learning ⇛ Bootcamp		◎	◎		♣	♣			➢ Young women ➢ Tech company leaders	➢ Programming ➢ Socio-emotional skills ➢ Job skills
21	Emplea-Tech formacion de jovenes para el economía digital	2017	Regional: 1. Guatemala 2. Panama 3. Dom. Republic	Junior Achievement Dominicana	$2,988,000	Blended Learning ⇛ Part-time training		◎	◎		♣	♣			➢ Youth 16-29 ➢ Young women	➢ Programming ➢ SAP Data processing ➢ Socio-emotional skills ➢ English skills ➢ Job skills
22	Habilidades para el futuro	2019	Regional: 1. Argentina 2. Chile 3. Mexico 4. Peru 5. Uruguay	Fundación Forge	$8,000,000	Blended Learning ⇛ Part-time training		◎	◎		♣	♣	♣		➢ Youth 16-29 ➢ Young women	➢ Digital skills ➢ Socio-emotional skills ➢ Job skills
23	Technology and Sports: Education for the Future	2019	Regional 1. Argentina 2. Colombia 3. Ecuador :	Fundación SES	$3,707,700	Blended Learning ⇛ Integrated into formal educational settings	◎	◎	◎						➢ Secondary students	➢ Computational thinking ➢ Digital citizenship ➢ Programming ➢ Robotics basic ➢ Socio-emotional skills
24	Google.org	Pipeline	Regional 1. Brazil 2. Mexico 3. Panama	Vary by country	NA	Blended Learning ⇛ Part-time training		◎	◎		♣				➢ Youth 16-29	➢ Google IT Certificate ➢ Socio-emotional skills ➢ Job skills
25	Telefonica.org	Pipeline	Regional 1. Chile 2. Colombia 3. TBD	Fundación Telefónica	NA	Self-directed learning ⇛ Online Platform		◎	◎		♣				➢ Unemployed people	➢ No information on specific type of skills

Training Elements		Employability elements	
FS = Foundational skills DS = Digital skills	SES= Socio-emotional skills ToT = Trainer the trainers skills	JPrep = Job preparation and career counseling JobPlac = Job placement and retention	E = Entrepreneurship CE = Continuing Education

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