revista
brasileira de
avaliação

Experience report

Evaluating the impact of a Skills Training Program in Brazil

Avaliando o impacto de um Programa de Qualificação Profissional no Brasil

Filipe Matheus Silva Cavalcanti[1]* ⬤, Lucas Pereira Sarti[2] ⬤, Viviane Helena Silva da Rocha[1] ⬤

[1]*Iniciativa de Empregos e Oportunidade no Brasil (JOI Brasil) do J-PAL, São Paulo, SP, Brasil*
[2]*Generation Brasil, São Paulo, SP, Brasil*

Filipe Matheus Silva Cavalcanti, branco, Research Associate na Iniciativa de Empregos e Oportunidade no Brasil (JOI Brasil) do J-PAL.

Lucas Pereira Sarti, branco, Analista de Parcerias na Generation Brasil.

Viviane Helena Silva da Rocha, negra, Analista de Pesquisa e Políticas Públicas na Iniciativa de Empregos e Oportunidade no Brasil (JOI Brasil) do J-PAL.

Abstract

In recent years, Brazil has seen a surge in the availability of skills and non-cognitive training programs. Despite this, a recent literature review has uncovered significant gaps in our understanding of the impact of these programs on the employability and income generation of young people and socially vulnerable individuals. This report details the progress of a partnership between Generation Brazil, a provider of programming training, and JOI Brazil, a J-PAL initiative focused on producing robust impact evaluations to inform public debate on labor-related issues. While the impact evaluation resulting from this partnership is still in its early stages, this report sheds light on the initial planning process for conducting a rigorous evaluation of training programs in the area of productive inclusion, as well as the challenges and opportunities for learning that arise. This report can be a valuable resource for policymakers interested in pursuing similar initiatives.

Keywords: Randomized impact evaluation. Productive inclusion. Skills training.

Resumo

Nos últimos anos, uma ampla gama de programas de treinamento vocacional e não-cognitivo têm sido ofertados no Brasil. No entanto, uma revisão recente da literatura revela lacunas significativas na compreensão do impacto desses programas na empregabilidade e geração de renda de jovens e pessoas em situação de vulnerabilidade social. Este relatório tem como objetivo compartilhar a evolução da parceria entre a Generation Brasil, um provedor de treinamento em programação, e a JOI Brasil, uma iniciativa da J-PAL focada em gerar avaliações de impacto robustas para informar o debate público sobre temas relacionados ao trabalho. Embora a avaliação de impacto resultante desta parceria ainda esteja em seus estágios iniciais, este relatório destaca os primeiros passos do planejamento de uma avaliação rigorosa de programas de treinamento no campo da inclusão produtiva, bem como os desafios e oportunidades de aprendizado envolvidos. Os formuladores de políticas interessados em seguir caminhos semelhantes podem se beneficiar deste relatório.

Palavras-chave: Avaliação de impacto aleatorizada. Inclusão produtiva. Qualificação profissional.

Introduction

In 2020, Brazil had the 5th highest youth unemployment rate in Latin America and the Caribbean, at 30.5% (World Bank, 2020). This may be attributed to a lack of specific skills demanded by companies, as the profile of a good candidate should be composed of technical (knowledge to develop specific tasks), cognitive (remember, learn, improve) and socioemotional (interpersonal ability and communication) skills (ManpowerGroup, 2022). Thus, many training initiatives have been offered to address this skills gap (ILO, 2020; J-PAL, 2017; McKenzie, 2017). While impact evaluations show success in fostering new skills, actual results on employment and income are mixed. Nonetheless, some promising features of these programs include tailored to market training, financial incentives, on-the-job training, socioemotional skills development, job search support, and financial assistance (J-PAL and IDB, 2022). Understanding which combinations of those features are the most effective is crucial to improve the prospects of such initiatives.

Generation Brazil, a non-profit organization, offers skills training in the technology sector to bridge the gap between job opportunities and qualified individuals. The program emphasizes both technical and soft skills, provides welfare services, material support, and job search assistance. Since 2019, over 2800 learners, primarily from vulnerable backgrounds, have participated, with a dropout rate below 9%. Around 77% found employment within 180 days post-program, showcasing its capacity in job placement.

In this experience report, we aim to share the collaboration of Generation Brazil with JOI Brazil to conduct an impact evaluation assessment and implement a randomized experiment. This evaluation aligns with Generation Brazil's commitment to evidence-based decision-making. Throughout this process, Generation Brazil has refined their Theory of Change, deepened their understanding of impact evaluation methodologies, and developed an evaluation plan tailored to their program. This engagement also prompted Generation Brazil to reflect on their operations, enhance their data management practices, and implement innovative recruitment solutions.

The report is organized into four sections. The first section provides an overview of the Generation Brazil program, highlighting its features and objectives. In the second section, the partnership between Generation Brazil and JOI Brazil is described, detailing its steps and presenting the specific randomization solutions that were proposed. Section three synthesizes the main learnings and insights gained from this collaborative process. Section four concludes the report.

The Generation Brazil program

Generation is a global non-profit organization founded in 2014, it has a methodology designed to serve hundreds of thousands of people who are unemployed, underemployed, or need to learn new skills. Generation defines its effectiveness along breadth (scale and outreach), depth (income and placement outcomes within 6 months), and durability metrics (sustained outcomes 2-5 years after graduating). Its goal is to provide training to prepare, place, and support young people in accessing careers that would otherwise be inaccessible. The Generation Brazil also offers additional student support services such as soft skills training, welfare services and material support, and job search assistance.

In 2019, Generation started its operations in Brazil with a focus on training and placing vulnerable young people in the technology sector. The program aims to create a pathway to economic mobility for these individuals by promoting employment in an industry that offers higher-paying jobs. Even after four years, the opportunity that motivated Generation Brazil remains relevant. A study by Brasscom shows that there will be almost 800,000 job openings in the tech industry between 2021 and 2025 in Brazil, while the projection for graduates in technology during this period is only 530,000. Generation Brazil aims to bridge the gap between the number of opportunities and the number of qualified individuals by matching job-seeking young people from vulnerable backgrounds with tech job vacancies.

Generation Brazil can be categorized as an employment education program, driven largely towards the technology sector. Its skills training courses are offered in the format of a "coding bootcamp". The program duration ranges from 295 to 440 hours and is currently implemented in three cities in Brazil, with plans for expansion to a fourth state capital. As of February 2023, Generation Brazil has reached more than 2800 learners, with an average dropout rate below 9%, and approximately 77% finding employment within 180 days post-program.

The selection process consists of multiple eliminatory stages, including application form submission, online tests, motivational challenge, and interviews. Generation Brazil targets individuals aged 18 to 30 who have completed high school or have a technical education background and are currently unemployed. The program seeks youth interested in technology and coding, with an aptitude for logic and problem-solving, a collaborative mindset, and a motivation to pursue a career in information technology. Diversity is an important goal for the organization, considering factors such as gender, race, LGBTQIAP+ status, disabilities, location, housing conditions, and environment. Priority is given to individuals from lower-income backgrounds (classes E, D, and C) with monthly incomes below 2,000 BRL. The selection process aims to form groups with a minimum representation of 50% women and 60% non-white individuals.

The program provides a pre-course pathway, which prepares participants for the bootcamp experience. It includes courses on soft skills, technical foundations, and specially curated content developed by the Generation team. Throughout the program, students have access to intensive courses in various technology areas, with both synchronous live classes led by instructors and asynchronous online study materials and exercises. For students facing social vulnerabilities, the program offers social welfare services and material support. These include a food allowance, internet assistance, and laptop loans.

The program also provides assistance in job search activities, such as talent fairs where students showcase projects developed during the coding bootcamp and share their resumes with participating companies. Additionally, Generation offers a wide range of solutions to promote employability amongst the learners, such as a digital recruitment platform for recruiters, as well as self-placement efforts (weekly job newsletters, invitations to workshops and webinars, access to exclusive professional development content, among others). Mentoring support is available to all participants after course completion, facilitated by volunteer mentors. The program also offers sessions to help students build their CVs, workshops on personal and professional development.

Generation utilizes data and impact measurement as a foundation for its operations. Comprehensive data on program inputs, outputs, and results are collected by all teams, ensuring accuracy in reporting, and informing decision-making. Collaborations with academics and public partners are conducted to enhance validity and gain insights. Evaluation is also prioritized to enhance accountability and program effectiveness. Some observational and quasi-experimental assessments of the impact of its programs in different contexts have been conducted, such as tax revenues and costs in the USA and UK, employment outcomes in Kenya, learner profiles and employment in France, and comparisons with other providers in India.

Evaluation planning

In line with the experience of their teams around the world and given their commitment to consolidate their methodology, Generation Brazil was driven to search for tools that could promote its upcoming operation in Brazil as a reliable solution for both tech companies looking for qualified talents, and for young vulnerable learners in need of an opportunity to access life-changing careers. In early 2022, Generation Brazil participated in JOI Brazil's social incubation process to incorporate additional monitoring and evaluation processes into their operations. Their motivations were to gain a deeper understanding of the impact on vulnerable youth, effectively report impact outcomes and ultimately make better informed decisions. These improvements would facilitate safe scaling of operations and reaching new audiences.

Through the initial part of this process, Generation Brazil developed a comprehensive Theory of Change (ToC) that articulated their progress and long-term vision, guiding their efforts to promote systemic change in the Brazilian labor market. In the remaining part of the process, joint efforts were made to plan an evaluation. This section first details the preceding steps of this partnership building. It then reviews the literature on programs like the one developed by Generation Brazil and outlines the partnership definition of the methodological path to construct an evaluation of the organization training and accompanying program in Brazil.

The JOI Brazil social incubation process

JOI Brazil's social incubation process aims to assist organizations whose activities and programs are in the area of employability, entrepreneurship, and income generation in creating their ToC and evaluation plan. The primary objective is that these programs and public policies become evaluation projects that might systematically and robustly provide answers to pressing questions about the Brazilian labor market. In this sense, JOI Brazil brings closer organizations that implement projects focused on the labor market and productive inclusion with evaluation potential and researchers willing to conduct academic evaluations involving these projects.

The social incubation process comprises two phases: the "Workshop" and "Technical Assistance." During the Workshop phase, participants receive synchronous, virtual training on monitoring and impact evaluation tools. What sets this training apart is its practical application sessions, where participants can directly apply the tools to their own programs and public policies, supported by dedicated mentoring. The ultimate objective of JOI Brazil's Technical Assistance is to facilitate in-depth discussions and collaboration among teams, leading to the identification of two or three randomized evaluation strategies for the proposed program or its components. The Technical Assistance also provides guidance on evaluation facilitators, implementation considerations, and the necessary requirements for each strategy.

During the workshop phase, the Generation team learned about the importance of using evidence in policy, identifying different types of evaluation and their specificities, differentiating between rigorous and non-rigorous evidence, and understanding the advantages and disadvantages of different types of impact evaluation methods. Moreover, they were taught how to describe the concept of causality and detail the problems associated with attributing causality in the social sciences. During the workshop, the team not only gained valuable insights but also developed their own ToC. This involved understanding the components and assembling the causal chain specific to their program.

Briefly, the elaborated ToC summarizes that the program directly addresses the needs of vulnerable youth who face unemployment and limited access to relevant training. It achieves this by providing a comprehensive set of inputs and activities, including technical skills training, socioemotional skills development, mentorship, and support in networking and job placement. By equipping youth with the skills demanded by the job market, the program aims to enhance their employability, leading to improved income levels and overall quality of life. Its overarching objective is to bridge the gap between the lack of qualified individuals and the availability of job opportunities. Through targeted training and support, the program empowers youth, enhances their skills, and expands their networks, ultimately enabling them to secure sustainable employment and achieve higher incomes, thereby significantly improving their lives.

The Generation team enrolled in January 2022 for the workshop and in March 2022 the kick-off of the technical assistance activities happened, in which there was a joint effort – JOI Brazil staff together with the project team – to refine the construction of the randomized impact evaluation plan of the program, seeking at the same time to contribute to the design of the evaluated policy and respond to academic knowledge gaps. The technical assistance lasted three months and included biweekly meetings between the Generation staff and the JOI Brazil team. The goal of the meetings was to develop an impact evaluation plan and assess the implementing organization's capabilities and requirements.

During the initial phase of our collaboration, we found that Generation Brazil had a global methodology with over 70,800 graduates. These graduates had shown positive labor market outcomes, with 81% employability within 3 months of program completion. The program targets individuals with high social vulnerability, with 93% of graduates having no income before participating. While there have been no experimental evaluations of the program in other countries, economic literature suggests that coding bootcamp training can have positive effects on future income and employment quality (J-PAL, 2022). The organization was interested in conducting an experimental evaluation in Brazil and engaged senior staff to communicate with JOI Brazil for the partnership. Also, the program was already mature in collecting participant data, which would facilitate an evaluation.

During technical assistance, Generation engaged in discussions surrounding the alignment of their program's ToC, developed during the workshop, with relevant literature. This exploration aimed to leverage academic knowledge to enhance the program's design and effectiveness. By reviewing the latest research findings, Generation gained valuable insights into evidence-based practices that could inform program adjustments and optimizations. This integration of academic knowledge ensures that the program remains up-to-date and maximizes its potential for positive impact.

Additionally, the technical assistance phase involved analyzing issues related to data collection and the practical feasibility of implementing a randomized experiment. If the identified indicators required new data sources or additional data collection, plans were devised to gain access and collect the necessary information. Furthermore, the outcome of the technical assistance activities included power calculations and determining the optimal sample size for the experimental groups involved in the study. These analyses provided a solid foundation for conducting a potential impact assessment. From the early stages of technical assistance, Generation Brazil's program was matched with researchers from the J-PAL network through JOI Brazil's intermediation, fostering collaboration and knowledge sharing.

Since going through the workshop and technical assistance stages, Generation´s progress toward more evidence-based and data-driven decision-making was noticed by funders. One funder identified a significant change in the way the organization views and values data. In 2022, Generation started to dig deeper into their historical data, by making comparisons between groups, analyzing data to understand the current employment landscape, improving the way they collected data, and presenting their Key Performance Indicators in a more transparent and organized way.

A preliminary evaluation plan

Generation offers a job training program in technology using a coding bootcamp format, which falls under the category of skills training programs. Literature suggests that these programs generally yield mixed results in terms of employment and income outcomes (J-PAL and IDB, 2022). It is important to note that such programs can be expensive, with costs ranging from a few hundred to over ten thousand dollars per person trained (McKenzie, 2017; Blattman and Ralston, 2015).

However, coding bootcamps and digital skills training, when combined with additional support, have shown success in less developed countries. For example, in Kenya, providing digital skills training along with job referrals increased participants' chances of securing employment and improving their income (Atkin et al., 2021). Similarly, in Argentina and Colombia, coding bootcamps have enhanced programming skills, created job opportunities in the technology field, and better prepared participants to face challenges like the COVID-19 pandemic (Aramburu et al., 2021). The most effective programs in this area focus on a highly qualified sector, collaborate with the private sector, and offer intensive training along with various forms of support (J-PAL, 2022).

Based on the early promising results and considering the growing popularity of the bootcamp skills training model, it becomes crucial to conduct a rigorous evaluation of the Generation tech program in Brazil. While there is a scarcity of established evidence in this area, an evaluation

of the program can significantly contribute to the existing pool of findings and provide a broader diagnosis of the potential gains associated with this model.

The evaluation will prioritize three key outcomes as benchmarks for measuring learners' immediate success after the program: overall employment, formal employment, and the probability of earning a salary of over R$ 2000. These outcomes have guided all planning efforts, ensuring that the evaluation aligns with the desired goals and objectives of the program. Two evaluation scenarios have been proposed to assess Generation's program. In the first scenario (Scenario 1), a "bubble" randomization strategy is suggested. This involves selecting three experimental groups: the first group consists of individuals who would definitely be approved for the program, while the second group comprises individuals who marginally meet the approval criteria. To accommodate more participants, the second group is expanded, and these individuals are randomly assigned to either a marginally approved or marginally unapproved group. The second scenario (Scenario 2) involves a simple randomization, where the pool of potentially approved learners is expanded, and a lottery is conducted to determine their approval status.

In Scenario 1, the randomized evaluation would specifically focus on the group of marginally approved individuals, who may possess different characteristics compared to the overall approved group. It would then be important to examine whether those who performed poorly in the selection process demonstrate different performance and outcomes throughout the program, compared to those who performed better. On the other hand, in Scenario 2, while generalizability of the results would not be a concern, it would be necessary to gather data on predicted student outcomes throughout the program and baseline information in order to accurately determine the required sample size and calibrate the potential pool of selected applicants. This information would help expand the initial pool appropriately. To facilitate these calculations, Generation has provided administrative data, which was utilized to assess the feasibility of these options and determine the most suitable approach for the program's impact evaluation. In the remainder of this section, we provide a comprehensive overview of the key calculations performed to devise the randomized evaluation plan. Additionally, we will delve into the essential operational aspects of the program that inform and guide these choices. By examining both the technical calculations and operational considerations, we aim to present a comprehensive understanding of the evaluation plan and its alignment with the program's objectives and implementation.

Scenario 1: Steps for the bubble randomization
The selection process of Generation learners to be part of the program involves multiple phases. In the period analyzed, about 10.2 thousand people signed up for the program, with this being the initial phase. Of this total, about 69.5% were considered eligible for the program. Of the total eligible, about 19% (about 1300) were approved in the last phase of the selection process, the interview. However, only 71.8% of those approved in the interview actually enrolled in the course, totaling 954 enrolled learners in the period. A bubble randomization approach would entail inviting a larger number of individuals for interviews and randomly approving a portion of those.

The objective of this planning phase was to validate a bubble randomization strategy by exploring potential correlations between students' performance in the selection process and their performance in the course, represented the percentage of activities submitted on time and the percentage of students who successfully graduated, and the percentage of students who secured employment upon completing the course. High correlations would spur the marginally approved group to be very different from the usually approved group.

Upon analyzing the data, positive patterns between all three outcomes and their performance in the selection process were observed. Thus, since individuals who performed poorly in the selection process tended to have overall less favorable outcomes, the strategy of relaxing entry criteria to expand the experimental sample size would not be ideal if there was a correlation between selection performance and future job placement. That is, an experimental comparison between the marginal groups could yield results very different from the program impact on

its actual target population. Those initial findings advised caution with bubble randomization. Moreover, power calculations indicated that the minimum detectable effects were higher than what is typically reported in the literature, highlighting the need for further considerations in the evaluation process to ensure robust and accurate results.

Scenario 2: Simple randomization
Considering the risks outlined earlier, Generation expressed a preference for conducting an evaluation using the simple randomization method. Under this approach, the study sample would include all participants who could potentially be approved in the Generation selection cycle of 2023 and 2024. Once pre-approved, participants could be randomized to participate in the intervention, while the others would be the control group. This experimental sample would closely resemble the typical pool of selected participants.

However, this would also involve some expansion of the pool of potentially selected learners and Generation estimated that around 1500 students would be available to participate in the experiment with no major changes in their operations and learners' profile, with close to half assigned to the control group and at least 700 to the approved group. Based on these numbers and potential variations in the study, several power calculations were performed to ensure statistical reliability with that sample size. It is important to note that Generation indicated the possibility of adjusting these figures if statistical inference proved to be underpowered, making the analysis of alternative scenarios essential to reach the ideal scenario. These power calculations incorporated data collected during the baseline evaluation. Upon analyzing the results, the only identified risk was that the minimum detectable effect exceeded the average reported in the literature.

Learnings

Conducting an impact evaluation is a priority for Generation Brazil, as it aligns with their mission and vision. The dedicated team is committed to investing the required efforts to accomplish their objectives. A vital aspect of this endeavor was the creation of a robust Theory of Change. This not only provided a solid framework for the evaluation but also enhanced the organization's reputation within the Brazilian non-profit sector and the broader workforce development field.

Over the past year, starting from March 2023, Generation Brazil and JOI Brazil have engaged in a close collaboration. The focus of this collaboration has been to provide JOI Brazil with the necessary data and insights to gain a comprehensive understanding of Generation's operations. Together, they have meticulously planned the implementation details for an upcoming randomized experiment scheduled for 2023-2024. This collaboration has been instrumental in ensuring the success of the evaluation and fostering a strong partnership between the two organizations.

From the perspective of evaluation planning, several key learnings can be highlighted. Firstly, it was recognized that when conducting a randomized impact evaluation of a program with a high degree of selectivity among its participants, the pool of approved applicants needed to be expanded in some way. This expansion had to be carefully planned to avoid unexpected and inherently unique characteristics within the experimental sample compared to the typical target population. Different levels of expansion for program approval were studied, and these thresholds were used to calculate the necessary statistical power. Clear information sharing and setting of expectations between teams, particularly regarding statistical power, were deemed essential. The availability of pre-existing data from other program cohorts and other types of evaluations, such as process evaluations, proved to be crucial during the planning phase.

Armed with knowledge of these risks, an informed decision could be made to proceed with the impact evaluation. Additionally, the exchanges and insights provided by JOI Brazil have been challenging Generation Brazil's team to reflect on their operations and practices, especially when it comes to the collection of learners' data. For instance, the process of

sharing databases and data pipelines with JOI Brazil over the months has helped Generation in identifying possible bottlenecks that could be keeping it from making the most out of their available data. Also, this planning has served as a catalyst for Generation's Engagement team to implement innovative solutions in the recruitment process. Generation has also identified areas within their mobilization strategy that could be improved to reduce dropout rates during the selection process and support candidates in progressing through the application funnel.

Final remarks

To address the mismatch between young people's skillset and the profile sought by companies, training programs have been widely offered in recent decades. While these programs are generally successful in fostering new skills, they often have mixed results on employment and income. Generation is a global non-profit organization founded in 2014 that helps unemployed, underemployed, or those who need new skills. Generation Brazil specifically focuses on training and placing vulnerable youth in the technology sector. Collaborating with JOI Brazil, Generation Brazil has embarked on an assessment to implement a randomized impact evaluation. This partnership has been instrumental in refining their evaluation mindset, deepening the understanding of impact evaluation methodologies, and developing a tailored evaluation plan.

The planning of the impact evaluation has provided valuable insights. Generation Brazil recognized the importance of expanding the pool of approved applicants to test the impact of a highly selective program. Leveraging pre-existing data and clear information sharing with JOI Brazil has been crucial for this planning to succeed. The collaboration prompted Generation Brazil to reflect on their data collection practices and implement innovative solutions in recruitment. These points have shown that the high opportunity costs of an evaluation can lead to lasting changes in operational efficiency, even in non-evaluation-specific areas. Due to the partnership, Generation Brazil is now well-equipped to generate robust evidence on their program's effectiveness in providing access to technology jobs for learners in need of life-changing opportunities.

Generation Brazil's progress towards evidence-based decision-making has attracted funders' attention. Impact evaluations can serve as valuable tools for funders, enabling informed investment decisions. Yet, it is also crucial to understand the specific contexts and populations in which job training programs of this sort thrive. This understanding can inform program design and maximize employment outcomes. Their rigorous evaluation can provide insights into the most effective approaches to skills training, foster continuous improvement, and create better outcomes for individuals seeking employment and socioeconomic advancement.

Financial support

Generation Brazil is funded by a strong network of partners that support its mission via philanthropic (private donors) and corporate responsibility investments. We also collaborate with government agencies for talent qualification policies. In 2023, Generation Brazil is funded by: Arymax Foundation, B3 Social, Lenovo Foundation, Santander, VRB, LinkedIn, Brava Foundation, Telles Foundation, and Garcia Family Foundation.

Additionally, a network of +50 partner companies is committed to hiring Generation graduates and making a co-investment in the organization for every talent hired, such as Itaú, SumUp, Dasa, Mercado Livre, and many others.

Launched in 2020, the Jobs and Opportunity Initiative (JOI) is a J-PAL worldwide initiative that aims at generating robust evidence on policies that address pressing labor market challenges. In 2021, in partnership with the Arymax Foundation, B3 Social, Potencia Ventures, the Inter-American Development Bank, and Insper, J-PAL Latin America and the Caribbean launched the Jobs and Opportunity Initiative Brazil (JOI Brazil), which will replicate the actions of JOI for the Brazilian context. In 2022, the Tide Setubal Foundation joins the partnership.

Conflict of interest

References

Abdul Latif Jameel Poverty Action Lab – J-PAL, & Inter-American Development Bank - IDB. (2022). Evidências sobre políticas de mercado de trabalho e implicações para o Brasil: Qualificação profissional. Cambridge, MA: J-PAL.

Abdul Latif Jameel Poverty Action Lab – J-PAL. (2017). J-PAL skills for youth program. Cambridge, MA: J-PAL.

Abdul Latif Jameel Poverty Action Lab – J-PAL. (2022). Sectoral employment programs as a path to quality jobs: Lessons from randomized evaluations. Cambridge, MA: J-PAL.

Aramburu, Julian, Goicoechea, Ana, & Mobarak, Ahmed Mushfiq. (2021). *Coding bootcamps for female digital employment*. Washington, DC: World Bank Group. Working paper.

Atkin, David, Schoar, Antoinette & Wahnschafft, Kiara. (2021). *Evaluating Sama's Training and Job Programs in Nairobi, Kenya*. Cambridge, MA: MIT. Policy Note. https://www.povertyactionlab.org/sites/default/files/research-paper/Samasource%20Evaluation%20Final%20(2)_0.pdf

Blattman, Christopher, & Ralston, Laura. (2015). *Generating employment in poor and fragile states: Evidence from labor market and entrepreneurship programs* (52 p.). USA: SSRN. http://dx.doi.org/10.2139/ssrn.2622220

International Labour Organization – ILO. (2020). Global employment trends for youth 2020: Technology and the future of jobs. Geneva: ILO.

ManpowerGroup. (2022). *Pesquisa Escassez de Talentos 2022*. São Paulo, SP: ManpowerGroup.

McKenzie, David. (2017). *How effective are active labor market policies in developing countries?. A critical review of recent evidence* (Policy Research Working Paper, No. 8011). Washington, DC: World Bank.

World Bank, 2020. Unemployment, youth total (% of total labor force ages 15-24) (national estimate) - Brazil. International Labour Organization. "Labour Force Statistics database (LFS)" ILOSTAT. Accessed September 05, 2023. ilostat.ilo.org/data.