TC Document

1. Basic Information for TC

▪ Country/Region:	MEXICO
▪ TC Name:	Increasing Productivity with Equity: Training Youth to Use Generative AI for Better Labor Market Outcomes
▪ TC Number:	ME-T1542
▪ Team Leader/Members:	Talamas Marcos, Miguel Angel (RES/RES) Team Leader; Azuara Herrera, Oliver (SCL/LMK) Alternate Team Leader; Cristia, Julian P. (RES/RES) Alternate Team Leader; Urquiola Ralero, Montserrat (RES/RES); Smith, John D. (RES/RES); Casco, Mario A. (ITE/IPS); Escobar Genes, Myriam Helvecia (RES/RES); De Dobrzynski, Esteban (LEG/SGO); Moreno, Michelle Leonor (ITE/IPS); Sarrazin, Tom (RES/RES)
▪ Taxonomy:	Research and Dissemination
▪ Operation Supported by the TC:	ME-L1280, ME-T1442
▪ Date of TC Abstract authorization:	27 Aug 2024.
▪ Beneficiary:	Mexico
▪ Executing Agency and contact name:	Inter-American Development Bank; Miguel Talamas (RES/RES) MIGUELTA@IADB.ORG
▪ Donors providing funding:	OC SDP Window 2 - Economic Growth(W2F); OC SDP Window 2 - Social Development(W2E)
▪ IDB Funding Requested:	OC SDP Window 2 - Social Development (W2E): US$150,000.00 OC SDP Window 2 - Economic Growth (W2F): US$150,000.00 Total: US$300,000.00
▪ Local counterpart funding, if any:	US$0
▪ Disbursement period (which includes Execution period):	30 months disbursement and 24 months execution period
▪ Required start date:	December 13, 2024
▪ Types of consultants:	Firms and individual consultants
▪ Prepared by Unit:	RES-Research & Chief Economist
▪ Unit of Disbursement Responsibility:	RES/RES-Research & Chief Economist
▪ TC included in Country Strategy (y/n):	YES
▪ TC included in CPD (y/n):	NO
▪ Alignment to the Update to the Institutional Strategy 2025-2030:	Social inclusion and equality

2. Objectives and Justification of the TC

2. 1 The skills young people develop in school often do not perfectly align with labor market demands due to the rapid pace of technological and organizational innovations that continually transform the workplace, like generative Artificial Intelligence (AI). Generative AI has considerable potential to boost productivity (Azuara et al., 2024), but there are deep concerns regarding the distributional consequences of this technology. Recent experimental evaluations have shown that training software programmers,

business consultants, and customer representatives to use generative AI can boost measures of productivity and potentially reduce within-occupation inequality, as those with lower baseline performance seem to improve the most (Brynjolfsson et al. 2023; Dell'Acqua et al. 2023; Peng et al. 2023). These studies have mainly focused on the intensive margin: how access to AI affects performance on the current tasks or at the current job.

2.2 The experimental evaluation funded by this TC innovates by estimating the effects of AI on the intensive and extensive margins of labor market outcomes: productivity (wage) and promotions when staying in the same firm/industry (intensive margin) and wage and position when switching jobs (extensive margin). Additionally, we will measure the distributional effects on labor market gaps by income, skill level, and gender. Methodologically, we will apply a baseline survey to at least 250 individuals to collect demographic information, skill levels, labor market prospects, and baseline use of generative AI.

2.3 Our study will focus on students who will shortly join the labor market or who have been in the labor market for up to a few years. This demographic is likely to be a stronger adopter of AI and information technology in general relative to older cohorts. Hence, it represents an opportunity to understand the effects of AI on productivity for people joining the labor market now and for those who will join in the near future. We will randomize participants into treatment and control groups, and we will invite the treatment group to a course on using generative AI. Finally, we will apply surveys to measure the intensive and extensive margin and distributional effects 6 and 12 months after completing the course.

2.4 We will stratify assignment to the treatment group by baseline observed skills levels to allow us to estimate differential effects on labor market outcomes and assess whether the effects of this training are regressive or progressive (i.e., whether they help more high- or low-skilled individuals, respectively). Similarly, we will estimate the effect of AI knowledge on career paths and occupation fields. Is the treatment group more likely to switch to specific fields, and from which fields or occupations are they more likely to leave? What is the increase in wage associated with these changes?

2.5 We will analyze treatment effect heterogeneity by taking advantage of recent advances in this area (Athey and Imbens 2016; Athey et al. 2019). We will also analyze the costs entailed in the intervention and how these relate to the earnings effects documented. Finally, we will analyze whether targeting students with more significant expected effects on earnings is equivalent to targeting students with low expected counterfactual earnings. That is, we will assess whether a productivity-equity trade-off exists.

2.6 This TC will fund research activities that will shed light on how Latin American governments can leverage advances in generative AI to improve the productivity of their labor force equitably. In particular, one avenue to take advantage of the advances in generative AI involves training workers to use this technology to augment their productivity and labor market outcomes. Hence, the TC seeks to contribute substantially to our current limited understanding of how to best take advantage of the opportunities opened up by generative AI to improve productivity equitably.

2.7 Developing and testing the labor market effects of such training could be particularly important for LAC countries, considering that low productivity and high inequality are among our region's top challenges. Moreover, emerging evidence suggests that productivity effects are stronger for those with lower skill levels, which suggests potential reductions in inequality among workers in the same occupations. This technology could also tackle a central growth restriction for LAC, namely our region's average low levels of skills. Hence, this TC will assess the effects of an innovative, low-cost, scalable model that could open substantial opportunities for Latin American governments seeking to leverage technological advances to tackle key policy challenges.

3. Alignment. The TC is consistent with the IDB Group Institutional Strategy 2024-2030: Transforming for Scale and Impact (CA-631) and is aligned with the objectives of reducing poverty and inequality and bolstering sustainable growth by seeking to find cost-effective programs that take advantage of advances in AI to promote improvements in labor market outcomes, especially among disadvantaged populations. The TC is aligned with the Development Effectiveness Intelligence Fund as it funds a research project that aims to generate knowledge and contribute to reducing strategic knowledge gaps in our understanding of Development Effectiveness by implementing an experimental evaluation in a vital area.

3.1 The program is aligned with the IDB Group Country Strategy with Mexico 2019-2024 (GN-2982) through its priority area of supporting equitable and sustainable access to social services within Section II (social policy), relating to the strategic objective of strengthening the labor market. The operation is also consistent with the Labor Sector Framework Document (GN-2741-12), highlighting interventions to raise labor productivity and ensure that gains are shared equitably. Likewise, it is consistent with the Skills Development Sector Framework Document (GN-3012-3) in its lines of action: (i) Ensure access to relevant and high-quality learning opportunities throughout life; (ii) Leverage the use of technology to expand equitable access to skills development opportunities and make skills development systems more efficient; and (iii) Actively promote the generation and use of empirical information to guide decisions regarding skills development. This TC will build upon lessons learned from loan operation ME-L1280, for which Phase I has been 100% disbursed and is expected to generate relevant knowledge to support Phase II of this operation currently under design.

3.2 The research aligns directly with the GN-2819-14: Window 2 Priority Areas of Social Development and Economic Growth. On the one hand, the intervention is expected to increase the human capital of participants which could lead to better employment opportunities and remuneration. On the other hand, increasing productivity of the labor force is a key driver behind economic growth because it allows firms to, for example, increase their output, improve their quality, or reduce their costs.

4. Description of activities/components and budget

4. 1. This TC involves the implementation of three components.

4.2. Component I: Training design US$61,000. This component will fund the design of a comprehensive training program tailored to youth in Mexico, aiming to enhance their skills in using generative AI to improve their labor market outcomes. Activities include the hiring of firms that will design a curriculum and implement it on a small scale. The curriculum will be designed to be engaging and accessible, incorporating a mix of lectures, hands-on projects, and interactive modules. To ensure high-quality content, experts in generative AI and education methodology will collaborate on creating training materials, including detailed lecture notes, practical exercises, and digital resources. The budget will also cover a qualitative and quantitative evaluation of the pilots.

4. 3. Component II: Training implementation US$125,000. This component focuses on the delivery of the training program. Activities include recruiting and onboarding participants through targeted outreach efforts, scheduling training sessions, and deploying experienced instructors who are experts in generative AI. The training will be delivered in-person, through workshops held in selected locations in Mexico to ensure high take up and a robust delivery. Participants will benefit from a structured learning path supported by continuous mentorship and access to in-person discussions and networking opportunities. Additionally, ongoing monitoring and feedback mechanisms will be established to adjust the training in real time based on participant progress and feedback. The product of this component will be an implementation report that will document how the training proceeded, including statistics of participants' attendance and measures of fidelity of implementation.

4. 4. Component III: Evaluation and dissemination US$114,000. Using an experimental design, the evaluation component measures the training program's impact on participants' labor market outcomes. A baseline survey will be conducted to collect demographic information and labor market prospects from 250 youth. After that, study participants will be randomly assigned into treatment and control groups. The treatment group will be invited to participate in the training course focused on improving their labor market outcomes by learning how to use generative AI tools. Surveys will be conducted six and twelve months after graduation to gather follow-up data. These datasets, combined with administrative records, will serve as the primary inputs for the impact evaluation of the program. The expected products include a comprehensive dataset with baseline, six-month, and twelve-month follow-up data, detailed analysis of the training program's impact on employment rates and labor earnings, and reports documenting the evaluation process and findings. This component will also include the organization of a hybrid workshop in Washington, DC to disseminate the findings of the evaluation.

4. 5. Indicative budget. The TC's total budget is US$300,000 financed by the OC SDP Window 2 - Economic Growth(W2F) US$150,000 and OC SDP Window 2 - Social Development(W2E) US$150,000. The execution will be in 24 months and 30 months for disbursement. The table below shows the detailed budget.

Indicative Budget

Activity/Component	Description	IDB Fund Funding	Donor Funding W2F	Donor Funding W2E	Total Funding
Component I: Training design	Design curriculum and training materials	61,000	36,000	25,000	61,000
Component II: Training Implementation	Delivery of in-person training with an RCT	125,000	0	125,000	125,000
Component III: Evaluation	Measuring training impact	114,000	114,000	0	114,000
	TOTAL	**300,000**	**150,000**	**150,000**	**300,000**

4. 6. Responsibilities for supervision and monitoring this operation will fall on RES/RES, including regular meetings with counterparts and consultants. The UDR for this TC will be RES/RES. The Team Leader is Miguel Talamas at RES/RES and the Alternate Team Leader is Julián Cristia at RES/RES.

5. Executing agency and execution structure

5. 1. The Bank will execute this TC through RES/RES. The main reason for this execution structure is that the Bank has developed strong expertise in using technology, including AI, to improve human capital development. In particular, the Bank has edited a book on how to use technology for math learning, a Technical Note on how to promote effective programs in technology in education (RG-T2634), a report on digitalizing public services, and several experimental evaluations assessing the effects of using technology to tackle educational challenges (PE-T1431, RG-E1856, and RG-E1886). This accumulated expertise will be exploited to ensure a robust implementation of the TC and ensure that the findings from this project are embedded in future Bank operations policy dialogue and are used to promote capacity building in countries in LAC that seek to use technology for learning cost-effectively.

5. 2. The TC will be co-executed in close collaboration with the Labor Markets Division to ensure an alignment with the thematic priorities of the sector. The experience of the sector specialist of LMK will ensure the correct design of the course and the elements to be evaluated. The evidence collected with this TC will complement those obtained with ME-T1442, “Reshaping TVET for the 4th Industrial Revolution. A new model for the consumption of micro-courses"; and RG-T3894, “Using Technology to Identify Skills in LAC”.

5.3. The Bank will contract individual consultants, consulting firms, and non-consulting services to carry out the activities described. All procurement to be executed under this Technical Cooperation have been included in the Procurement Plan (Annex IV) and will be hired in compliance with the applicable Bank policies and regulations as follows: (a) Hiring of individual consultants, as established in the regulation on Complementary Workforce (AM-650) and (b) Contracting of services provided by consulting firms in accordance with the Corporate procurement Policy (GN-2303-33) and its Guidelines. The knowledge products generated from Bank-executed activities within this technical cooperation will be the property of the Bank and may be made available to the public under a Creative Commons license. However, at the request of the beneficiaries, in accordance with the provisions of AM-331, the intellectual property of said products may also be licensed through specific contractual commitments that shall be prepared with the advice of the Legal Department. The knowledge products that will be generated as part of this TC will be produced and disseminated in accordance with AM-331 and AM-325.

6. Major issues

6. 1. One potential risk is that a low percentage of the youth assigned to the treatment group may enroll and participate in the training program. This could result from a lack of awareness, interest, or perceived relevance of the training and logistical barriers such as transportation, time constraints, or competing commitments. We explore tackling this risk by employing different strategies, including (i) organizing an initial activity for all study participants (including treatment and control group) to start with a sample of individuals that make a time investment in the activity, signaling genuine interest in the training; (ii) provide incentives for participation, such as certificates of completion or small financial rewards; (iii) offer logistical support such as transportation stipends and flexible training schedules, and online training options to accommodate different needs.

6. 2. Another risk involves the availability of qualified specialist instructors in Mexico. The training program's success heavily depends on working with qualified specialists and instructors proficient in generative AI and effective teaching methodologies. To tackle this risk, we will initiate an early and extensive recruitment process to identify and contract qualified professionals. We plan to work collaboratively with academic institutions, AI research centers, and technology companies to source expertise and possibly conduct joint training sessions. Moreover, we will monitor learning sessions to ensure that instruction takes place with high fidelity.

7. Exceptions to Bank policy

7. 1. This TC does not involve any exceptions to Bank policy.

8. Environmental and Social Aspects

8.1. This Technical Cooperation is not intended to finance pre-feasibility or feasibility studies of specific investment projects or environmental and social studies associated with them; therefore, this TC does not have applicable requirements of the Bank's Environmental and Social Policy Framework (ESPF).

Required Annexes:

Request from the Client_71741.pdf

Results Matrix_69714.pdf

Terms of Reference_98431.pdf

Procurement Plan_41427.pdf