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Revised Draft Report

Guatemala TVET Evaluation Design Report

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ACRONYMS

CBC	Competency-based curriculum
CEFET	Federal Technical Education Centre
CNB	Currículo Nacional Base
CONOCER	Labor Competency Standardization and Certification Council
EA	Evaluability assessment
ENCA	Escuela Nacional Central de Agricultura
FTP	File transfer protocol
GEP	Guatemala Education Program
GoG	Government of Guatemala
GOPA	GOPA worldwide consultants
GTEP	Guatemala Threshold Education Program
ILO	International Labour Organization
IPC	Institutional and Planning Capacity
INTECAP	Instituto de Capacitación
IRB	Institutional Review Board
LAC	Latin America and the Caribbean
MCC	Millennium Challenge Corporation
MINEDUC	Ministry of Education
PRONACOM	Programa Nacional de la Competitividad
TVET	Technical and vocational educational training
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	United States Agency for International Development

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I. INTRODUCTION

A. Country context

Guatemala, like many countries in Latin America and the Caribbean (LAC), has made impressive progress in expanding education coverage, particularly at the primary level. However, many youths who could enroll in higher levels of education remain out of school, and in some cases, even students enrolled in school have no access to high-quality education. In 2013, only 8 percent of more than 141,000 upper secondary graduates met achievement standards in math, and just 26 percent met the reading criteria (Asturias de Barrios 2014). Nearly 2 million Guatemalan youth age 15 through 24 lack the foundational skills needed to enter the formal workforce (USAID 2015). These education gaps carry over to the workforce. Only 12 percent of the workforce completed secondary education, and just 3 percent completed postsecondary education (GoG 2012). As a result, Guatemala does not have enough specialists in areas most crucial to entrepreneurship and innovation, such as engineering skills and scientific training, and many firms report difficulty finding qualified workers to fill highly skilled positions (World Bank 2014).

To improve secondary education and youth workforce development, the government of Guatemala has partnered with the Millennium Challenge Corporation (MCC) through a threshold program focusing on secondary education in the country. The Guatemala Education Project (GEP) is one of two activities under the threshold program and is organized around three activities: (1) Éxito Escolar is designed to strengthen the competencies of educators to promote equitable, high-quality secondary education, help improve student transition from lower to upper secondary education, and strengthen learning outcomes; (2) the Technical and Vocational Education and Training (TVET) activity, which supports the Ministry of Education (MINEDUC) and the National Central School for Agriculture (ENCA) in improving technical and vocational education and training; and (3) the Strengthening of Institutional and Planning Capacity (IPC) activity, which strengthens the institutional capacity of MINEDUC.

B. Objectives of this report

In September 2016, MCC contracted with Mathematica Policy Research to evaluate GEP. The evaluations of Éxito Escolar and Institutional Strengthening (IPC) activities are already underway. In this report, we describe the design for the evaluation of the technical, vocational education and training (TVET) activity (Activity 2), which includes the GOPA Training for Work for MINEDUC and ENCA activities. The evaluation of the TVET activities consists of a mixed-methods performance evaluation, including a pre-post outcomes analysis, implementation study, and multisite case study, to understand implementation and assess how the TVET activities contribute to participants' preparation for the labor market.

In the chapters that follow, we provide context for the evaluation and describe the planned evaluation design in further detail. In Chapter II, we outline the specific TVET activities and program logic. In Chapter III, we summarize the literature related to the effects of similar interventions. In Chapter IV, we discuss the research questions that our evaluations seek to

answer and describe the evaluation design and data sources that we will use to conduct the evaluation. We conclude in Chapter V with a discussion of administrative details related to the evaluation.

II. OVERVIEW OF THE ACTIVITY AND IMPLEMENTATION PLAN

A. Overview of TVET sub-activities

In this chapter, we provide context for the planned evaluation by describing the TVET activities and the mechanisms through which the activities will affect outcomes, as set out in the program logic.

1. Project description

MCC and the GoG designed a project that addresses some of the most critical constraints in the vocational education system including up-to-date curriculum, trained teachers, and accreditation systems for TVET institutions. MINEDUC hired GOPA Worldwide Consultants to implement the project under the oversight of PRONACOM (Programa Nacional de la Competitividad). The TVET system in Guatemala serves as a technical secondary education track where students who complete this formal schooling are awarded a technical specialization in their area along with a high school diploma. GOPA is implementing two Training for Work TVET programs in Guatemala (Figure II.1). The TVET Activities support MINEDUC and ENCA to develop new tools and strategies to enable TVET to match supply to demand in the labor market.

Figure II.1. GOPA Training for Work Programs for MINEDUC and ENCA activities

GOPA Training for Work Programs

Training for Work GOPA-MINEDUC activities (November 2017 – October 2020)

- Targets 13 Vocational education and training (TVET) secondary institutions in Alta Verapaz, Chiquimula, Guatemala, Jalapa, Sacatepéquez and Sololá.
- Targets three occupational families within upper secondary grade levels: tourism and hospitality, information and communication technology, and transportation and maintenance of vehicles.
- 472 expected student beneficiaries and 70 teachers to receive technical training.
- First cohort of upper secondary students is expected to graduate in November 2021 (school closures related to COVID-19 may delay the graduation date).Expected graduates is estimated at 295.

Training for Work GOPA-ENCA activities (October 2018 – October 2022)

- Targets 1 secondary ENCA institution and 18 Agriculture and Forestry secondary institutions.
- Targets one occupational family within the upper secondary grade levels: Farming and Agricultural and Forestry Use.
- 200 expected student beneficiaries in 2024. Up to 150 teachers will receive technical training.
- One upper secondary student cohort is expected to begin in 2022 and to graduate in November 2024 (from one ENCA institution).

Five activities make up the TVET activity, as summarized in Table II.1.

Table II.1. GOPA activities for Training for Work for MINEDUC and ENCA activities

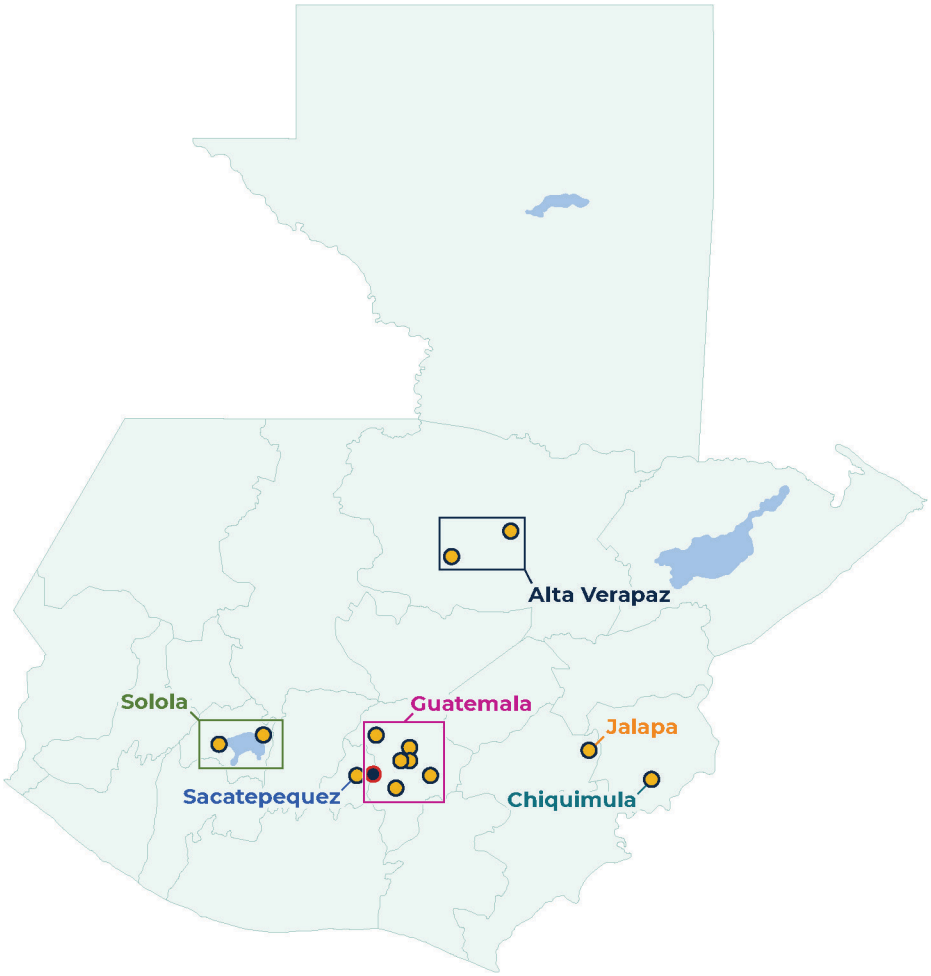
Planned Activities for Training for Work Programs	Sub-activities	Target Audience
Coordinate between the education and labor sectors to hold departmental and national roundtable discussions and working groups (*mesas sectoriales departamentales y mesas sectoriales nacionales)*	Harmonize competencies and qualification levels across TVETs and develop specific course qualifications, training modules, and support materials. Promote the permanent relationship between the public and private sectors, while updating and designing job training programs that respond to the needs of the country's productive sectors.	Public Sector Private Sector
Design curricula for seven new vocational training upper secondary careers (*carreras*) and redesign two existing curricula	Design seven new TVET careers: three in hospitality (hotel administration and management, tourism administration and management, food and beverages), one in transportation (mechanics and automotive management), two in informational technology (digital content and software, web systems), and one in agroindustry (ENCA). Support ENCA to redesign two curricula: one in agronomy and one in agri-forestry.	MINEDUC ENCA staff Faculty Students
Design a technical teacher refresher/actualization program and retrain 220 teachers	Strengthen the knowledge and technical skills of: • 70 TVET upper secondary teachers in tourism, information, and communication technology, and transportation occupational families through approximately 676 hours of training (in-person and online) • 150 TVET upper secondary teachers in agroindustry, agronomy, and forestry occupational families through about 200 hours of training (in-person and online).	TVET upper secondary teachers in 32 secondary institutions (including 1 ENCA and 18 Agriculture and Forestry secondary institutions)
Implement TVET upper secondary careers in 14 pilot secondary institutions	Implement the seven new and two updated TVET careers in 14 pilot secondary institutions (13 MINEDUC and one ENCA). Support MINEDUC and ENCA to identify and sign agreements with the relevant private sector companies to encourage diversity in recruitment. Provide training and technical assistance to MINEDUC and ENCA to carry out the accreditation of the educational centers to offer the new programs and to certify graduates.	MINEDUC, ENCA, and TVET Faculty
Implement media campaigns	Develop permanent communication and dissemination campaigns to promote the transition from lower secondary to vocational training and raise awareness about new accreditation and certification mechanisms.	Students Parents Teachers Civil Society Organizations

Note: ENCA and the agriculture and forestry institutions will receive technical assistance to carry out accreditation to offer the new careers and certify graduates.

2. Geographic coverage and project participants

The geographic scope of GOPA's activity covers 14 TVET upper secondary institutions across six departments in Guatemala (Alta Verapaz, Chiquimula, Guatemala, Jalapa, Sacatepéquez, and Sololá). MCC selected these departments to invest in based on their poverty index, educational promotion and dropout rates, and the presence of few or no investments by international donors[1]. Figure II.2 shows a map of the 13 institutions selected to implement careers in hospitality, transportation, and informational technology (flagged in yellow circles) and one institution selected to implement careers in agroindustry, agri-forestry, and farming (flagged in black circle). An additional 18 TVET institutions will implement the latter three careers in 2022.

Figure II.2. Map of TVET institutions (MINEDUC and ENCA)



[1] The selection information for the Departments was discussed during the inception trip in a meeting with John Wingle (MCC), Luisa Mueller (MINEDUC), Jennifer Heinz (MCC), and Audrey Moore (Mathematica). During the meeting MINEDUC explained how the Departments were selected. The criteria were documented in meeting notes kept by the evaluators.

The main participants in the TVET activity are students and teachers in the target TVET centers. The primary beneficiaries of the TVET activities are upper secondary students in the target TVET centers. A total of 672 (472 MINEDUC and 200 ENCA) upper secondary students will benefit from the new curriculum, new occupational areas, and links to the private/business sector. The Training for work program will train 220 teachers, across all occupational families, who will also benefit from the TVET activities. These teachers will benefit from professional development, deepening their content knowledge of the new curriculum, teaching new delivery styles, and developing strategies to interact with the business community. MINEDUC and ENCA will also benefit from the interventions since they will have better teachers in the TVET institutions who can implement new competency-based curricula. We plan to conduct focus groups and interviews with members of both populations to understand the potential qualitative effects of the project on teacher uptake of new skill sets, perceptions of the new curriculum, and student graduation rates.

3. Description of implementation to date

a. Selection of the sectors

The current TVET program builds on two previous TVET programs funded by the European Union that focused on improving the TVET system in Guatemala: the *Programa de Apoyo al Sector Juventud* and the *Programa de Empleo Juvenil.* The *Programa Juventud* generated information on the status of training and capacity-building and labor demand in Guatemala as well as the conditions and opportunities youth had to obtain employment (PRONACOM 2017). The Project created a labor training model based on the concept of occupational job families with the aim of improving the employability, job skills and competences of youth as well as entrepreneurship. The first 28 occupational families were identified in 2011 and based on the number of people working in the occupational category. Studies were also conducted, as part of the projects, analyzing the occupational choices of migrants returning to Guatemala (PRONACOM 2017).

Participants in the identification of these occupational families included MCC, the Ministries of Economy, Labor, Agriculture and Food, Social Development, the National Statistics Institute (INE), the Technical Institute for Training and Productivity (INTECAP), the National Program for Competitiveness of Guatemala (PRONACOM) and the University of San Carlos de Guatemala (PRONACOM 2017). These stakeholders also coordinated with actors such as Wal-Mart, textile companies, Universidad Rafael Landívar, Universidad Mariano Gálvez, technical vocational institutes and the Municipal Centers of Training and Human Formation (CEMUCAF) of the Ministry of Education to ensure that both the demand and supply-side of the labor market participated in the decision-making process (PRONACOM 2017). By the end of the *Programa Juventud,* stakeholders developed labor competencies for eight of the occupational families.

The *Programa Empleo Juvenil* began in 2013 and continued to implement the *Sistema Nacional de Formación para el Trabajo* (National System for Job Training known as SNFT for its Spanish acronym). The project helped create the National Catalog of Occupational Families, Catalog of Qualifications of prioritized occupational families, training modules and the Certification and

Accreditation Protocols of the qualifications, which laid the foundation for the labor market working groups in the current project.

During the design of the TVET procurement, MINEDUC, in collaboration with MCC, selected 10 of the 28 identified occupational families based on the prioritization process that had taken place under the EU projects. MINEDUC then selected three of the 10 families for focus under this program.

b. Selection of the institutions

To select the institutions, GOPA proposed selection criteria and MINEDUC selected 13 institutions that are implementing the approved curriculum in the targeted occupational families. Under the ENCA Training for work program, only one institution will begin implementation in 2022 (the ENCA institution). The remaining institutions must improve the infrastructure and equipment before they can begin implementation in the future.

c. Curricular Development

Implementers have been holding round table discussions and working groups with the public and private sectors in all target departments for both Training for Work programs. The outcomes of the round table meetings included qualitative input from key stakeholder groups that helped define job skills and competencies; agreement on qualification levels; input into the development of the new curricula, the training modules, and support materials. GOPA also conducted diagnostics of the target TVET institutions to assess the existing infrastructure, furniture, technological equipment, and human resources. They discussed the criteria for selecting the TVET institutions with MINEDUC's Sinafel commission and PRONACOM. In January 2018, MINEDUC selected the TVET institutions that were best equipped academically and technologically to implement the target careers.

d. Teacher Professional Development Program

The Training for Work programs include a technological-pedagogical refresher/actualization program for secondary teachers in the target TVET institutions implemented by INTECAP (Instituto de Capacitación) in hospitality, transportation, and informational technology. The refresher/actualization program in agroindustry, agri-forestry, and agronomy is implemented by Virginia Tech and EARTH, in partnership with GOPA. The refresher/actualization program is comprised of both in-person and online training and aims to support teachers in the implementation of labor competencies and the use of technologies to strengthen the teaching-learning process in the relevant occupational family. The teacher training program has experienced a series of delays due to difficulties in contracting teachers with the requisite qualifications to teach the hospitality, transportation, and informational technology careers. The number of contracted teachers with 011 and 021 teacher contracts were insufficient to carry out the implementation of the new careers and therefore they hired teachers with 185 contracts. However, the 185 contracts ended in 2019 and a new hiring process is taking place again in 2020. This process resulted in the need for additional time to be spent on the preparing and completing the necessary documents to hire the teachers to participate in the professional

development program. PRONACOM postponed the refresher course from February 2019 to November 2019 (expected to be completed by November 2020). PRONACOM also reduced the number of training hours from 800 to 676 and the number of teachers from 90 to 70 due to the higher than expected costs of the program and insufficient number of TVET teachers. This reduction in both the training hours and number of teachers adds to GOPA's concerns around the proper dosage of training and having enough teachers to implement the new curriculum in the TVET institutions.

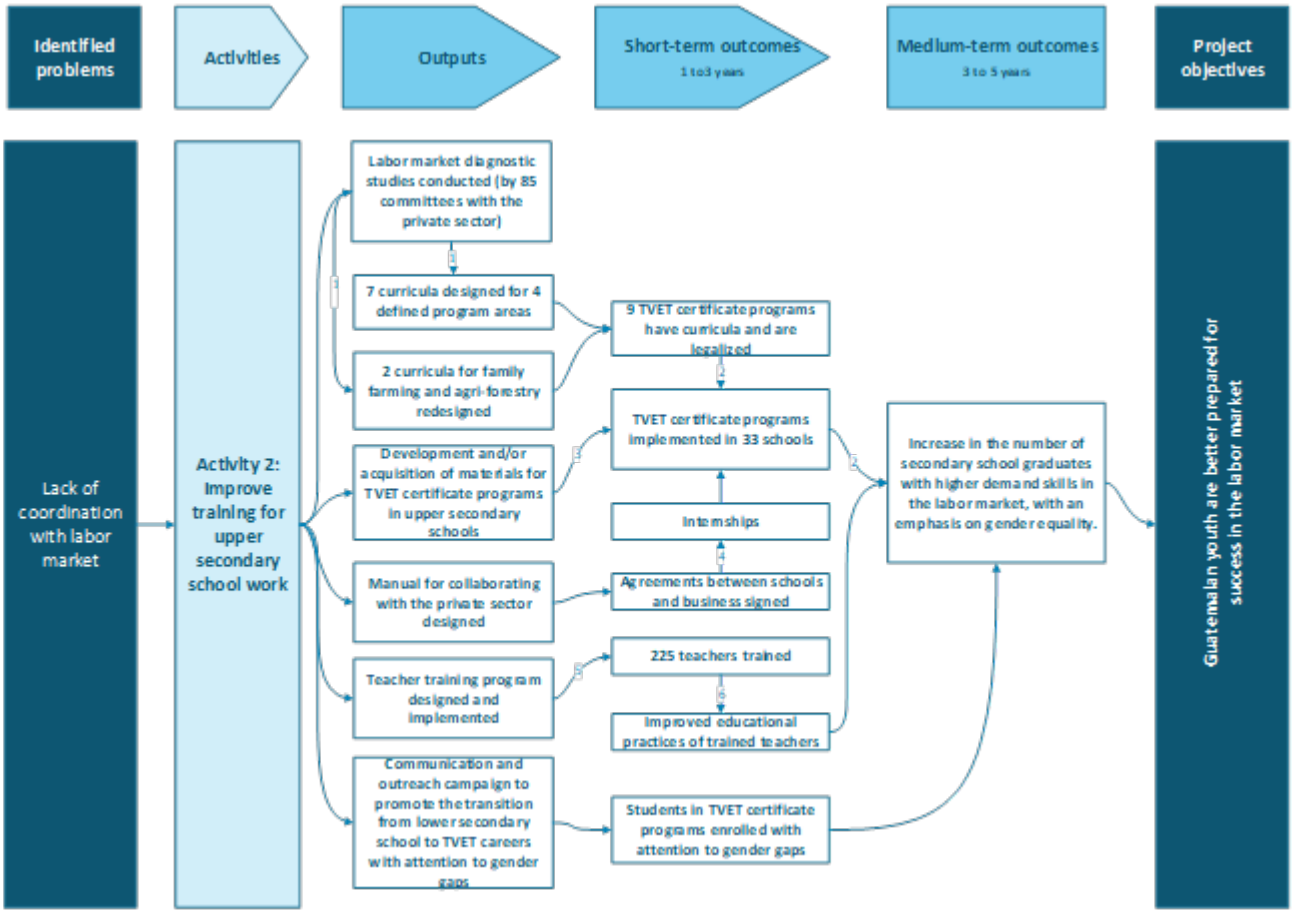
The refresher program in agroindustry, agri-forestry, and agronomy will train up to 150 teachers from the target TVET secondary institutions within the system of Agriculture and Forestry for 200 hours (120 in person and 80 online). The refresher training in agroindustry, agri-forestry, and agronomy began in April 2019 and ended in January 2020.

B. Theory of change

A theory of change lays out the hypothesized causal pathways that translate the project's activities into the outputs and outcomes that eventually would lead to its desired medium-term outcomes. Understanding these pathways is crucial to assessing whether the project has made positive contributions. The TVET program logic encompasses a series of hypothesized causal links among program outputs and short- and medium-term outcomes that potentially support the program's overarching goal of improved preparation of youth for entry into the workforce (Figure II.3). Each of the links in the program logic represents an assumption by GTEP program designers about how the activities will affect participants—students and teachers in the target upper secondary education centers.

The program logic in Figure II.3 was developed by PRONACOM. It relies on the assumption that in the short term, the implementer will complete their deliverables as planned. The logic's short-term goals focus on legalizing the TVET certificate programs, implementing the new certificate programs, improving educational practices of trained teachers, and enrolling students in the TVET certificate programs. The logic's medium-term goals focus on increasing the number of secondary school graduates from TVET certificate programs with emphasis on gender equality. The program logic further assumes that these improvements in TVET offerings should contribute to the main project objective of improving the education of Guatemalan youth to enhance their potential for success in the labor market.

Figure II.3. The TVET program logic[2]



Source: PRONACOM

[2]The following are the assumptions associated with the numbers in the logic model figure.
#1. The logic model assumes the participation of the enterprises involved in the áreas of the sector committees. The risk is that enterprises do not respond, or those who respond are not representative.
#2. The educational centers where the TVET careers are implemented have the infrastructure, personnel, equipment and materials necessary to carry out their implementation according to plan. The risk is that Schools do not have one or more of the requirements to successfully teach TVET careers.
#3. The assumption is that there are, or can be developed, specialized materials to facilitate the instruction of the programs. The risk is that the acquisition costs of copyrighted materials exceed the capacity of the contracts.
#4. The assumption is that the number of companies that accept internship students are enough to serve all 5th and 6th grade students. The risk is that there are not enough companies in the area to enroll the students of the school in internships.
#5. The assumption is that the technical teachers are interested in receiving the training. The risk is that since the update is not mandatory, a large number of technical teachers do not participate.
#6. It is assumed that the teachers participating in the update program will continue to work during the duration of the project in the intervention education centers. The risk is that the teachers are reassigned to other educational centers and stop working at the current TVET institutions.

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III. LITERATURE REVIEW

A. Summary of the existing evidence

1. Working groups of the education and productive sectors

Continuous coordination and consultation between stakeholders from the education and productive sectors have the potential to align the interest of both parties in satisfying labor market demands. Departmental and sector-specific working groups, and roundtable discussions with participants in both sectors can serve as a useful forum for understanding the needs of the labor market and discussing how education programs can address business needs and help students successfully transition into the employment sector. In countries across Latin America and the Caribbean, strategic relationships between the education and productive sectors have emerged to provide more flexibility and better results in managing TVET and helping it adapt to the uncertainty of the labor market. For example, in Brazil, the concern for strategic relationships with the productive sector has led to the creation of the Federal Technical Education Centre (CEFET) responsible for establishing links with enterprises and coordination with the social and productive sectors. Chile has taken the strategic relationship even further by developing a dual training system that allows technical and vocational training as an activity shared between education institutions and the productive sector (UNESCO 2010).

Internships and on-the-job training, established in collaboration with the productive sector, are critical in helping students develop relevant knowledge and skills in their future occupation. Studies find positive impacts of internships and on-the-job training on job placement, income, and employability rate, but the impacts may depend on factors such as the overall behavior of the labor market and the scope and design of the programs. Additionally, these types of activities can be expensive for employers, both in terms of time to oversee the student and any required payments (that is, stipends). The costs could be a disincentive in the long term if employers do not see direct benefits to their companies from the investment in the students. Many countries in Latin America, including Argentina, Chile, Uruguay, Peru, Panama, and Colombia, have similar training programs to the Training for Work activity. Based on UNESCO (2010) assessments, the employability rates varied across programs in these countries, depending on how the education system and employers worked together to encourage the creation of courses more directed towards specific job placement opportunities. However, the report does show that programs like the “Chile Joven” and Training for Work models can have an impact on employability when closely linked to the overall behavior of the labor market, and the scope and design of the program (UNESCO 2010). In Argentina, the program was designed and implemented during a period of enormous unemployment, and while the number of student participants was high, the impact on youth job placement rates was negligible (Devia 2003).

In contrast, the Uruguayan program used several designs adapted to the different sub-groups of young people. While the number of students participating in the program was more limited, the job placement rates were satisfactory (Lasida, 2004). The impact on income was positive in most cases.

Working groups with specialists from the productive sector serve as a platform to emphasize the productive sector's training needs and define the relevant student/worker competencies and qualifications in the labor sector. The literature reveals that countries in Latin America have implemented competency-based programs, intended to recognize and certify the skills obtained through training processes and in the vocational environment (UNESCO 2010). The design of new coordination and management models is essential as a competency-based curriculum (CBC) cannot be introduced in the traditional style of institutional management (Briasco and Vargas 2001). In Guatemala, the Technical Institute for Training and Productivity (INTECAP) has applied the Norte model, Technical Standardization of Competencies, to the design of the plans and didactic material and the evaluation and certification of competencies (UNESCO 2010). Focusing on the competency training model, INTECAP has yet to include the certification model or the recognition of previously acquired competencies in its activities. Certifying competencies is an essential step because it would allow students/workers to signal to employers that they have proven and certified skills in areas relevant to the job. Therefore, it is plausible that coordination between education, labor training, and the production sector specialists will contribute to the development of relevant training materials and labor qualifications, with certifying the qualifications being an essential step in this process.

2. New vocational training curricula

Formal TVET centers in Guatemala do not currently offer the services that prepare employees with the skills that businesses demand (MCC 2014). This finding suggests labor market needs do not align with the skill areas and levels of the existing public TVET courses in Guatemala. Vocational curricula are often prepared and set by government officials who themselves have little or no exposure to the world of work, and TVET instructors have little or no knowledge of what students learn in school before they enter the TVET system. Instructors may also lack up-to-date information on the needs of employers and must teach curricula that incorporates new content without replacing the outdated, irrelevant material (Axmann 2004). The result is that the curriculum is overloaded, and the teaching and learning do not develop the skills needed in the labor market (Johanson and van Adams 2004). Better alignment of the TVET courses and the labor market requires providers to make significant changes to their existing courses, such as designing new and relevant TVET curricula and training materials. The participation of both current instructors and the productive sector in the curriculum development process can help shape these courses to meet labor needs.

Countries in Latin America have begun to transform their training systems: the curriculum, the management model, and the training itself. Mexico implemented similar reforms to those proposed in Guatemala. After conducting a thorough evaluation of the Labor Competency Standardization and Certification Council (CONOCER), Mexico detected inadequate mastering by graduates of certain key competencies, including basic linguistic and analytic thinking skills, and a lack of coordination between educational establishments, teachers, students, and production sectors, among others. In response to this diagnosis, Mexico developed its Competencies-Based Human Resource Training Program (CBC) aimed at improving the relevance of technical and vocational training. Activities included designing new curriculum and information programs, links with enterprise, and technical support (UNESCO 2010). The

development and introduction of the CBC were necessary to better respond to the labor market requirements, and it shifted the curriculum emphasis from memorization to professional competencies and soft skills. The CBC developed a broad spectrum of skills in students by developing three sets of competencies: generic (comprising socioemotional and citizenship skills), subject-specific, and professional competencies (skills required in specific occupations). The creation of the National Competency Standards for technical programs and the approval of 85 technical programs covering, among others, the fields of agriculture, services, and information have helped the education and training sector be more responsive to the needs of the economy. An evaluation of the Skills-Based Human Resources Training Program in Mexico demonstrated positive and statistically significant differences in the probability of being employed among graduates from federal schools with higher levels of upper secondary education, including TVET reform implementation (World Bank 2016).

3. Vocational teacher refresher training

The technical vocational teacher training refresher program will include modules on basic labor training, specific labor training, didactic training, soft skills, and use of technology. The objective of the training is to improve the knowledge level and the technical and pedagogical skills of teachers, give them practical experience, strengthen their knowledge of formative evaluation, and incorporate content on gender equality and social inclusion. The literature suggests that support to teachers is critical to the continual development of pedagogic skills. Popova and Evans (2015) looked at six reviews that examine the interventions that improved learning outcomes in low- and middle-income countries. The results of their analyses show that teacher training interventions have the second-largest effects on learning outcomes. The success of teacher training interventions depends mainly on the quality and nature of the training itself. The Employment Policy Department at the International Labour Organization (ILO) conducted an analytical assessment of the TVET teacher training systems and presented several essential pillars that make up successful teacher training systems, such as structure, relevance, responsiveness, innovation, and communication, among others. Incorporating these pillars into the TVET teacher training systems will ensure higher quality training, responsiveness to labor market needs, adoption of differentiated teaching strategies that respond to unique student needs, integration of emerging technologies into curricula, and information sharing, consultation, and negotiation between educational authorities and the public and private sector (ILO 2015).

The technical and vocational training refresher curricula will focus on developing the methodology, knowledge, and skills of teachers in the target areas. The curricula are based on needs identified by teachers themselves and developed with the participation of stakeholders from the productive sectors. Knowles (2003) finds that ongoing, intensive professional development that focuses on supporting teachers' planning and instruction has the greatest likelihood of influencing teacher practice. However, it is important to keep in mind that one-touch training workshops are often the least successful in changing classroom behavior. Cohen and Hill (2001) suggest that teacher training can affect teachers' practices when the curriculum is designed to be consistent with the desired reforms. There is evidence in the literature that the refresher program focus is essential for producing a sustainable change in teaching methods and behavior. Once the refresher training is delivered, however, teachers are responsible for applying

the new knowledge in the classroom. To ensure proper uptake of the new skills and knowledge, the literature points to the importance of monitoring or observing teacher application of the new knowledge in the classroom and using the observations to improve additional dosage of training curricula.

4. New vocational training courses

MINEDUC and ENCA with the support of GOPA will implement seven new and two updated TVET courses across 14 upper secondary TVET centers as part of the intervention. Successful implementation and scaling up of the new TVET courses depend on several conditions. First, there must be enough demand from students for these new courses. Interest will likely be high because skills in areas of high labor market demand have high earnings potential. To overcome the misalignment between training and labor market demands, Radwan, Akindeinde et al. (2010) argue that the productive sector must partner educational institutions to support the curriculum development process. Thus, when the productive sector becomes involved in the development of the curriculum and training materials, the new courses are more likely to align with labor market needs and therefore attract students, increasing the demand for the courses. Targeted communication efforts (discussed later in this report) aimed at raising awareness of the potential benefits of the new TVET courses can further increase the demand for courses.

Successful implementation of the new courses would depend on the number of technically qualified and certified teachers available to teach the new and improved courses, which GOPA has indicated is a concern to the implementation process. Ensuring there are enough technically qualified secondary teachers could be challenging because of the innovative nature of the new courses along with documented challenges in recruiting sufficient teachers for the professional development program who had the prerequisite skills. GOPA is currently considering using an incentive scheme to achieve high participation and attendance of the refresher teacher training. The training is conducted in close collaboration with a consortium of universities and labor training centers. As noted earlier, there is evidence in the literature that professional development programs are essential for producing a sustainable change in teaching methods and behavior. However, the uptake of the information, in the long run, would depend mainly on the dosage and duration of the teacher training program.

Finally, to be successful, the new and improved courses must be financially sustainable. Initial assessment of the infrastructure in the target institutions demonstrates that not all institutions possess the required technology and infrastructure to implement these courses successfully. These institutions will require additional funding for upgrades to infrastructure and equipment. It is also possible that technological changes in industry or other evolving industry needs would require additional new investments (for example, in new equipment) so that students' skills continue to match the needs of the productive sector. These costs might be substantial and could pose a challenge to the sustainability of these courses, as it is unclear whether the existing co-funding relationships will be sustainable over time.

5. Media and outreach campaigns

MINEDUC and ENCA with the support of GOPA will implement communication and outreach campaigns to promote the transition from lower secondary school to TVET careers. Targeted communication is essential for increasing awareness of new TVET programs. Lessons from the youth education training program in Kenya demonstrate that despite significant TVET reforms, such as the creation of TVET Authority, National Qualifications Authority, and new curriculum, enrollment in TVET has remained relatively low. When the study team contacted youth to understand the reasons for such low enrollment, they found out there is large information deficit among the youth. Even though many have access to smartphones, electricity, and even TVs, youth spoken to by the team had not received information on TVET (Brookings Institution 2018). Lack of enough information about the benefits of TVET and entrepreneurship also gives rise to negative perceptions about TVET. Many young people and parents are not attracted to TVET because they associate vocational track programs with low academic performance, poor quality, and blocked pathways (UNESCO 2013).

Communication campaigns can be successful tools in promoting the benefits of TVET. However, the campaigns need to focus on highlighting existing gender gaps and changing the image of professions that are traditionally perceived as female- or male-dominant. Women are often discouraged from enrolling in technical and vocational programs and pursuing entrepreneurial opportunities. In Guatemala, as in many other countries, there are fewer women entrepreneurs compared to male entrepreneurs. In 2016, Guatemalan women business owners with employees represented approximately 27 percent of the country's total business owners. Additionally, women in Guatemala are over-represented in traditional trades such as beauty services, sewing, and baking, while men concentrate on technical areas that have greater access to markets and are better remunerated (USAID 2018). To address these gender gap challenges, implementers plan to consult with gender experts and incorporate specially developed tools designed to focus gender gaps and prevent exclusion based on gender.

TVET programs, supported by strong communications efforts, have been found to help increase entrepreneurship opportunities and skills, as well as tackling negative perceptions about TVET (Radwan, Akindeinde et al. 2010). However, media and outreach alone will not be enough to increase enrollment in vocational training. Communication campaigns can serve as tools to publicize the improved image, promote the newly reformed TVET system, and highlight the benefits for youth and their economic well-being. While other components of the intervention, such as transforming the TVET provision by aligning TVET offerings with labor demands, retraining teachers to ensure professional quality, and targeting gender inclusion have more significant potential to improve the quality and image of the TVET system.

B. TVET evaluation's contribution to the literature

Our evaluation of the Guatemala Education Program's TVET activity (Activity 2) will make several contributions to the existing literature. First, the results will help us understand the factors that contribute to students' transition through secondary education and into the workforce, thus expanding the body of international literature. The performance evaluation will give us insights into how the teacher professional development program functioned in practice

and whether the dosage and duration are aligned to the needs of teachers in the pilot TVET centers. The evaluation will also provide results on teacher uptake of new skills and knowledge and the extent to which programs such as Training for Work increased teacher skill sets. Second, the performance evaluation will provide additional data on how to best engage the private sector, their willingness to engage with TVET centers in Guatemala, and their perspectives on the costs and benefits of working with TVET institutions through the provision of internships, on the job training, and employment. Given the limited evidence on the links between the private sector, TVET centers, and actual job placement, our findings could make important contributions to further understanding the factors that best facilitate these transitions. Finally, our implementation study of the TVET activity will allow us to interpret the outcomes analysis and understand how and why the TVET activity achieved its results.

IV. EVALUATION DESIGN

In this chapter, we describe our proposed design for the evaluation of the TVET activity. We begin by reviewing the questions the evaluation seeks to address and providing a brief overview of the proposed evaluation design, which includes a fidelity of implementation study, a mixed-methods outcomes analysis, and a multi-site case study. We then describe each element of the design in further detail, including the data we will use to answer the evaluation questions.

A. Evaluation questions

Table IV.1 lists the revised core research questions discussed with MCC and based on changes and delays associated with the TVET program. The table also explains why this set of questions is essential to the evaluation. The research questions focus on assessing mainly the short-term outcomes, the fidelity of program implementation, and justification of program resource allocation. The change in focus is a result of delays in implementation that are compounded by the ongoing COVID-19 pandemic.

Table IV.1. Research questions for the evaluation of the VET Activity

Evaluation Questions	Rationale/justification
MINEDUC and ENCA Outcomes	
To what extent did the TVET program meet its short-term outcomes?	
1. To what extent do the TVET program curricula align with labor market demands? 2. To what extent do businesses believe students enrolling in TVET centers will meet labor market demands? 3. To what extent do teachers in the TVET system demonstrate new skill sets covered by the MCC-supported TVET training? 4. To what extent do MINEDUC and ENCA have the organizational capacity (e.g. human, institutional) to continue implementing and improving the TVET system? What aspects of the institutions need further strengthening?	The goal of the GEP TVET program is to prepare Guatemalans to succeed in the job market. GOPA will support MINEDUC and ENCA to revise the curriculum and develop new programs in the targeted TVET centers with the goal of streamlining the curriculum, aligning it to the needs of the workforce based on input from relevant private sector actors, and training teachers to deliver content to students. MINEDUC and ENCA programs will also provide work skills certification. These types of upgrades and investments should allow the target institutions to better align the curricula to labor market demands. Our mixed-methods approach, which includes outcome mapping and interviews/focus groups should provide insights into whether these short-term outcomes are met following completion of the project.

Evaluation Questions	Rationale/justification
Implementation of improved TVET secondary education programs	
To what extent was the TVET program implemented according to plans? Why or why not?	
5. Have new and improved TVET teacher training programs been able to recruit enough participants (limited to 35 due to room and instruction constraints)? 6. How did the sectoral studies, roundtables, and meetings influence the design and implementation of the TVET program? 7. To what extent were the teacher guides and student textbooks completed and provided to TVET institutions? a. How do the new materials align to the curricula? 8. To what extent do students have access to the equipment and supplies (i.e. at school, work, home) required to practice and apply what they learn? 9. To what extent do students in the program demonstrate the skills required to graduate and receive certification? 10. How is labor market information obtained and used to develop TVET programs and careers or determine which TVET programs and careers to provide to students? a. What gender differences exist in TVET enrollment across occupational families? How have the differences changed over time? 11. To what extent has gender-sensitive job counseling contributed to the perception that females now have access to a wider range of employment opportunities? 12. What kinds of interactions are taking place between TVET programs and employers? a. What is the frequency and quality of these interactions? Are they meaningful or just part of checking a box?	Implementation of project activities is the first step in the logic model and is a prerequisite for the short-term outputs and future outcomes to unfold. These questions allow us to assess the implementation process. The findings of the implementation study related to these questions are essential to discerning whether failures to meet medium- and long-term outcomes are related to implementation challenges. We will use fidelity of implementation criteria (described in section B) to assess the quality of implementation.
To what extent do the results of the TVET program justify the allocation of resources?	
13. How were resources invested during the program relative to inputs and short- to medium-term outcomes? To what extent could resource utilization have been improved?	We face important limitations in our ability to answer this question rigorously, but we can focus the analysis on the resources implementers planned to invest in the program, the resources they invested, and how their priorities shifted over time as the program design and implementation advanced.

B. Evaluation design overview

To answer the research questions described above, we plan to conduct a **mixed-methods performance evaluation** with three components. Table IV.3 summarizes each component of the evaluation and its associated data sources and key research questions, highlighting key outcomes for each question.

First, for each activity, we will conduct a fidelity of **implementation study** that will (1) explore how implementation is being conducted by implementers; (2) examine whether implementers adhered to the original program design, how and why changes to the design were made by implementers; (3) help contextualize short-term outcome results by describing the geographic, social, and policy environment in each of the Departments as well as each TVET center; and (4) provide a deeper understanding of how the project interventions may contribute (or not) to short-, and medium-term outcomes. The implementation study will draw on administrative data from MINEDUC and the TVET centers on enrollment, an online survey with directors of the TVET centers, interviews with key stakeholders, focus groups with students in the first cohort of the programs, and reviews of project and stakeholder documents, including the labor market diagnostic studies conducted by the departmental and national working groups. If the timing of data collection allows, we will also conduct observations of the teacher training workshops as well as observe trained teachers delivering the new content in classrooms.

To measure the fidelity of implementation, we will use the criteria elaborated in Table IV.2 to assess the acceptability, adoption, appropriateness, feasibility, fidelity, cost, and sustainability of the interventions.

Table IV.2. Fidelity of implementation criteria

Implementation outcome	Working definition	Related terms
Acceptability	The perception among stakeholders (for example, consumers, providers, managers, policymakers) that an intervention is agreeable	Factors related to acceptability (for example, comfort, relative advantage, credibility)
Adoption	The intention, initial decision, or action to try to employ a new intervention	Uptake, utilization, intention to try
Appropriateness	The perceived fit or relevance of the intervention in a particular setting or for a particular target audience (for example, provider or consumer) or problem	Relevance, perceived fit, compatibility, perceived usefulness or suitability
Feasibility	The extent to which an intervention can be carried out in a particular setting or organization	Practicality, actual fit, utility, trialability
Fidelity	The degree to which an intervention was implemented as it was designed in an original protocol, plan, or policy	Adherence, delivery as intended, integrity, quality of program delivery, intensity or dosage of delivery

Implementation outcome	Working definition	Related terms
Implementation cost	The incremental cost of the implementation strategy (for example, how the services are delivered in a particular setting); total cost of implementation includes the cost of the intervention itself. We will also look into the resources implementers planned to invest at the outset of the program and make comparisons to the resources they invested as the program implementation advanced. If expenditure data is available, we will compare the expected to actual costs.	Marginal cost, total cost
Coverage	The degree to which the population eligible to benefit from an intervention actually receives it	Reach, access, service spread, or effective coverage penetration (focusing on the degree to which an intervention is integrated in a service setting)
Sustainability	The extent to which an intervention is maintained or institutionalized in a given setting	Maintenance, continuation, durability, institutionalization, routinization, integration, incorporation

**Adapted from Peters et al. 2014

Table IV.3. Evaluation questions and outcomes, designs, and data sources

Components of the Evaluation			
Research questions and outcomes	**Implementation evaluation**	**Case studies**	**Data sources**
1. To what extent do the TVET program curricula align with labor market demands?	X	X	**Key Informant Interviews** • TVET directors • TVET faculty and staff • GOPA implementers • Businesses working with the program • MCC/PRONACOM
2. To what extent do businesses believe students enrolling in TVET centers will meet labor market demands?		X	**Key Informant Interviews** • Businesses working with the program
3. To what extent do teachers in the TVET system demonstrate new skill sets covered by the MCC-supported TVET training?		X	**Classroom observations** **Key Informant Interviews** • TVET directors • TVET faculty and staff
4. To what extent do MINEDUC and ENCA have the organizational capacity (e.g. human, institutional) to continue implementing and improving the TVET system? What aspects of the institutions need further strengthening?		X	**Key Informant Interviews** • TVET directors • GOPA implementers • PRONACOM • MINEDUC • ENCA
5. Have new and improved TVET programs been able to recruit enough participants?	X		**Administrative Data** • TVET enrollment data **Online survey with TVET Directors** **Key Informant Interviews** • TVET directors • GOPA implementers • MCC • PRONACOM
6. How did the sectoral studies, roundtables, and meetings influence the design and implementation of the TVET program?	X		**Document review** **Key Informant Interviews** • TVET directors • GOPA implementers • MCC • PRONACOM • Businesses working with the program

Table IV.3 (*continued*)

Components of the Evaluation			
Research questions and outcomes	**Implementation evaluation**	**Case studies**	**Data sources**
7. To what extent were the teacher guides and student textbooks completed and provided to TVET institutions? a. How do the new materials align to the curricula?	X		**Document/curricula review** **Online survey with TVET Directors** **Key Informant Interviews** • TVET directors • GOPA implementers • TVET faculty and staff • PRONACOM
8. To what extent do students have access to the equipment and supplies (i.e. at school, work, home) required to practice and apply what they learn?	X	X	**Online survey with TVET Directors** **Student focus groups** **Key Informant Interviews** • TVET directors • TVET faculty and staff
9. To what extent do students in the program demonstrate the skills required to graduate and receive certification?	X	X	**Online survey with TVET Directors** **Key Informant Interviews** • TVET directors • TVET faculty and staff
10. How is labor market information obtained and used to develop TVET programs and careers or determine which TVET programs and careers to provide?	X		**Key Informant Interviews** • TVET directors • GOPA implementers • Businesses
11. What kinds of interactions are taking place between TVET programs and employers? a. What is the frequency and quality of these interactions? Are they meaningful or just part of checking a box?	X		**Online survey with TVET Directors** **Key Informant Interviews** • TVET directors • TVET faculty and staff • GOPA implementers • Businesses
12. What gender differences exist in TVET enrollment across occupational families? How have the differences changed over time? a. To what extent has gender-sensitive job counseling contributed to the perception that females now have access to a wider range of employment opportunities?	X	X	**Administrative Data** • TVET enrollment data **Key Informant Interviews** • TVET directors • TVET faculty and staff • GOPA implementers **Student focus groups**
13. How were resources invested during the program relative to inputs and short- to medium-term outcomes? To what extent could resource utilization have been improved?		X	**Administrative Data** • Cost data from implementers' budgets **Key Informant Interviews** • PRONACOM • GOPA implementers • MCC

Finally, we will conduct a **multi-site case study** of 4 TVET centers (ENCA, implementing careers in agroindustry plus 3 MINEDUC centers, implementing careers in hospitality, transportation, and informational technology) across departments. We will work with MINEDUC, PRONACOM, and MCC to identify a set of TVET institutions with careers that are representative of the revised programs and meet varying degrees of expected outcomes. To obtain a diverse sample of TVET institutions, we will seek to include institutions in urban and rural localities, varying sizes and infrastructural conditions, and institutions offering a range of programs of study. The data for the case studies will be incorporated into the interview and focus group protocols for the implementation study and outcomes analysis to ensure efficiency in our data collection, analysis, and writing processes. Each case study will be 3-5 pages in length.

The timing of this evaluation is driven primarily by the parameters of the contract, the implementation progress, and when the student cohorts complete the program. Given the extension to the current Mathematica evaluation contract, we will be able to collect some outcome data a few months after the first cohort completes the TVET program (see Table IV.4) in November 2021[3]. Table IV.4 highlights the documents that we will gather and review as part of the evaluation as well as the time that beneficiaries are exposed to the interventions. Administrative data will be collected in 2020 and in 2021/2022 for the outcomes analysis.

Table IV.4. Time elapsed between GOPA activities and data collection for the evaluation

Activity	Completion/ end of contract	Data Collection	Number of months elapsed
GOPA MINEDUC			
Sectoral studies for tourism, transportation, and ICT	July 2018	March 2020	20 months
General curriculum design for workforce training	September 2018	August 2020	23 months
Specific curriculum design for workforce training (6 teacher guides and 22 student textbooks)	May 2020	August 2020	3 months
Proposal for accreditation and certification	July 2019	March 2020	8 months
Business-school manual (Manual for training in the workforce centers)	July 2019	March 2020	8 months
Description of the twelve qualifications corresponding to the six occupational families and training modules.	August 2019	March 2020	7 months
Strategy manual for departmental articulation of productive sectors.	November 2019	March 2020	4 months
Report on the Teacher refresher training/actualization program.	June 2020	August 2020	2 months

[3] The COVID-19 pandemic has resulted in school closures and the graduation timing of the first student cohort would depend on the timing of school reopening and whether students are promoted this school year.

Activity	Completion/ end of contract	Data Collection	Number of months elapsed
GOPA ENCA			
Diagnostics of human resources and infrastructure for workforce training in agronomy, forestry, and agroindustry	November 2018	March 2020	16 months
Design of the teacher refresher training/actualization for the three careers	March 2019	August 2020	17 months
Communication and dissemination campaign plan	April 2019	March 2020	10 months
Updated curriculum with competency methodology for the forestry course	June 2019	March 2020	9 months
Updated curriculum with competency methodology for the agronomy course	July 2019	March 2020	8 months
Updated curriculum with competency methodology for the agroindustry course	August 2019	March 2020	7 months
Accreditation protocols for educational institutions and student certification	September 2019	March 2020	6 months
Report on the teacher refresher training/actualization	June 2020	August 2020	2 months
Final report	October 2020	November 2020	1 months

C. Implementation evaluation

The first component of the performance evaluation is a fidelity of **implementation study**, which will focus on answering research questions 1-8 (implementation of improved TVET secondary education programs), as indicated in Table IV.3. These questions focus primarily on stakeholder and beneficiary perceptions of the program and its components (teacher guides, student textbooks, access to the equipment and supplies) as well as input from the sectoral studies and roundtable discussions, how GOPA has supported MINEDUC and ENCA in the program implementation, participant enrollment and gender differences across occupational families, interactions between the TVET programs and businesses, and the facilitators to implementation and challenges faced by the program. We discuss the primary data sources that we will use to answer these research questions.

1. Data sources

The implementation study relies on primary qualitative data collected from national and departmental stakeholders, TVET center faculty and staff, businesses, and students who are part of the first cohort. We will collect data between March-November 2020, which comes at the end of the two-year program. Our implementation evaluation will go beyond documenting how each activity was implemented in Guatemala. We will use a political economy lens[4] to explore how

[4] "Political economy is concerned with the interaction of political and economic processes in a society: the distribution of power and wealth between different groups and individuals, and the processes that create, sustain and transform these relationships over time". (S. Collinson, Power, Livelihoods and Conflict: Case Studies in Political Economy Analysis for Humanitarian Action, Humanitarian Policy Group Report 13, Overseas Development Institute, 2003).

implementation is influenced by the context (including the characteristics of the stakeholders and institutions involved). Given that MINEDUC and ENCA will play an important role in the future implementation of the program, we will use the political economy analysis to explore to what extent these institutions have the organizational capacity to continue implementing and improving the TVET system and whether they would need further strengthening. We will also collect program documents as specified in the GOPA deliverables schedule to review and document the planned timeline. We will conduct fieldwork for the implementation study in March-November 2020. We will interview the following stakeholders during the fieldwork process.

- **MCC staff (3 interviews).** We will interview key staff at MCC because they contributed to the design of the project, designed the Guatemala Education program, and ensured that social inclusion was a key part of the program. Interviews will cover the respondents' roles, their perceptions of successes and challenges, and their expectations of the effects of the project on key outcomes.
- **PRONACOM staff (3 interviews).** We will interview key staff at PRONACOM because they are responsible for overseeing and monitoring the implementation of the project in Guatemala. Interviews will cover the respondents' roles, their perceptions of successes and challenges, their perceptions of how the interventions will contribute to medium-term outcomes, and the prospects for sustainability.
- **GOPA staff (4 interviews**). We will interview Linda Asturias, the GOPA project director and key technical staff members of the Training for Work team who are responsible for implementing the project in Guatemala, including Simone Goncalvez (project manager in Germany), Estuardo Toledo and Edgar de Leon Moreno. Interviews will focus on how the program was implemented, the relationship of the project to national, departmental and local stakeholders, facilitators of implementation, challenges faced by the project, whether and how project objectives were obtained, and issues of sustainability. The interviews will also focus on the role of businesses and their relationship with the TVET centers.
- **MINEDUC (5-6 interviews).** The Ministry of Education serves as the main policy and decision-making ministry for education in Guatemala. We will interview staff from Minister Cynthia Saenz de Tejada's administration (helped design the program); the former technical vice-minister Hector Canto, who was in office during the initial years of the project, and key staff in the current administration who are continuing to engage in the implementation process. The purpose of the interviews will be to understand the role of the ministry in negotiating the activity and setting priorities for project investments. Our interviews with the current Minister and vice-ministers will focus on whether and how priorities may have shifted and their perspectives on the project outcomes and sustainability. We will also interview MINEDUC stakeholders to understand whether they have the human resources and institutional capacity to continue implementing and improving the TVET system. We will probe around institutional aspects that might need strengthening.
- **TVET Directors (8 interviews).** We plan to interview each TVET director at the selected TVET centers. We will randomly select the TVET Centers to ensure a mix of the six GOPA

MINEDUC centers represents a mix of the occupational families. We will also interview the ENCA TVET director and a member of the ENCA board of directors (*consejo directivo*). These interviews will help us understand curriculum changes, relationships with businesses, recruitment of instructors, potential gender differences in enrollment, contributions to future student prospects, facilitators and challenges to implementation, as well as organizational capacity to continue implementing and improving the TVET system.

- **TVET faculty and staff (7 focus groups).** We plan to conduct seven focus groups with teachers at seven of the TVET centers during two rounds of data collection (in the fourth quarter of 2020 and in late 2021/early 2022). Each focus group will average 6 to 8 participants. If there are fewer teachers at the TVET center, we will conduct a group interview. We will conduct two teacher focus groups with teachers per occupational family in the GOPA MINEDUC activity (total of 6) and one focus group with teachers at ENCA. By intentionally forming the focus groups by occupational family, we will be able to look at differences among the different TVET careers and centers.
- **TVET student cohorts (7 focus groups).** We will conduct seven focus groups with students during two rounds of data collection (in the fourth quarter of 2020 and in late 2021/early 2022) in the same TVET centers from which we draw teachers for the teacher focus groups. Each group will include 8 to 10 participants and represent students from all target occupational families available at the TVET center. We will randomly select students from an attendance list. We will consider separate focus groups for each occupational family if we determine that joint participation might affect the outcome of cross-family focus groups. The focus groups will help us understand changes in course content, pedagogic delivery, student perceptions about links to workforce opportunities, extent to which students have access to the equipment and supplies, and student perceptions on how the interventions may improve future work opportunities for students.
- **Businesses (8 interviews).** We will conduct interviews with business leaders who are engaged with the TVET centers either through the provision of internships or involvement with staff and the new curriculum. We will also interview any key potential businesses that are considering hiring graduating students from the TVET centers. Ideally, we plan to conduct up to 8 interviews, but it will depend on the number of businesses associated with each TVET center. We will target the business representative who was part of the working groups and serves as the main point of contact for the TVET center.

The FGDs will be led by our data collection firm, which brings familiarity with the populations and culture of the target participants. Successful focus groups require careful and purposeful selection of participants to gather quality data on the study themes. Mathematica will follow these steps to recruit participants for the proposed focus groups:

a. **Create a pre-screening tool for participant selection**. Focus groups are most successful when all participants contribute to the discussion. Our proposed focus groups require participants who share specific characteristics, such as participating in one of the occupational families, completing (or intending to complete) the careers, and working with staff or business partners. We also know that populations in the target areas vary by

socioeconomic status, languages, and ethnic backgrounds, which may affect their perspectives.

b. **Pre-screen participants.** To ensure a strong mix of characteristics among our focus groups, we will create a pre-screening tool that collects information on participants. This information includes data on characteristics such as location, socio-economic status, type of engagement in the project, type of support, and willingness to participate in a focus group. The data collection firm will apply the pre-screening tool as a checklist when they arrive at the TVET center in the morning.
c. **Select participants.** The data collection firm will select 8–12 participants for each focus group. We will hold the focus group discussions at each TVET Center.

There is no definite way to determine the proper sample size to gain significant insights into qualitative themes. The literature focuses on "reaching a point of saturation," which means that during data analysis, researchers determined that the same themes are recurring and that no new insights will come from conducting additional interviews or focus groups. We have elected to conduct 14 focus groups (7 with instructors and 7 with students) over the course of two rounds of data collection based on the time and resources available for the evaluation. However, if we find that saturation is not reached based on these initial numbers, we will conduct additional interviews and focus groups with specific populations.

To complement the qualitative fieldwork, we will also design and implement an online survey to gather data from the TVET directors. The online survey will be sent to all program TVET directors and collect information on the frequency of engagement with businesses, alignment of the curriculum to business demands, student enrollment and skill sets, and teacher competencies. These data will help us triangulate the data we gather from interviews and focus groups, while allowing us to reach all targeted TVET centers.

In addition to the interviews and focus group discussions, we will also conduct a **document review** of key project documents, including the proposed work plan for GOPA MINEDUC and ENCA, the M&E plans, sectoral studies, national and departmental working groups, teacher guides and student textbooks, implementation cost data, and quarterly reports. Table IV.6 provides a detailed summary of the qualitative data we plan to collect through interviews and focus groups as part of the implementation study.

2. Implementation study sampling strategy

We propose to use purposeful sampling to select key informant interview participants from all relevant stakeholder groups. Purposeful sampling is a type of nonprobability sampling whose objective is to create a sample that represents the perspective or "population" sought for the study. Researchers often identify this group by applying expert knowledge to non-randomly selected participants. Guest et al. (2006) suggest that implementation studies should interview at least 12 key informants as a minimum requirement. We propose to interview 29 key informants who engaged directly with aspects of the TVET activity.

For the focus groups, we propose to use maximum variation sampling to select seven TVET centers (one ENCA institution and six MINEDUC). We will use enrollment, M&E, and student cohort data to purposefully select the TVET centers from each occupational family. This sampling approach allows us to identify themes that occur consistently across centers and participants regardless of school performance and to identify issues that may be unique to any one group. We will use administrative data (including enrollment and test performance) to identify thresholds for the high- and low-performing centers. We will interview the TVET director from each of these centers and conduct one teacher and one student focus group at each institution.

For the online survey, we will target all the TVET directors from participating institutions. Mathematica staff in the United States will design and implement the online survey using survey solutions.

Before data collection, Mathematica, along with the data collection firm will conduct training on ethics and best research practices, including institutional review board (IRB) requirements for presenting informed consent to potential participants and storing and sharing the data.

3. Analysis of qualitative data

We will use the framework method to manage and systematically analyze our qualitative data from the interviews/focus group discussions and document review (Ritchie and Lewis 2003). This method begins with a careful review of the transcribed interview and project documents and includes making introductory notes in the margins to facilitate the coding process. We will follow four steps to analyze the data (Creswell 2009):

1. **Organize the raw data.** Raw data management is the process of organizing raw data into formats usable for analysis (that is, from audio files to transcripts). During raw data management, we will review all data and eliminate any that are incomplete or not useful to our analysis.
    - **Code data using chunking for initial coding.** This process, often referred to as data reduction, will enable us to read through the interview and focus group transcripts several times and obtain a holistic view of the data. We will use the framework method to organize and analyze themes, patterns, and issues in the data. We will develop a detailed initial coding scheme—a set of themes we might encounter in the transcripts that map to the research questions and conceptual framework. We will also document potential themes, linkages among results, and potential findings. After a review of the first few transcripts, the team will meet to develop the analytic framework of codes that will be applied to the remaining transcripts.
    - **Revise the coding scheme with more detailed coding.** This process involves refining the coding scheme and recoding data as we examine them in greater depth. We will use NVivo software to review and code the transcripts based on the initial codes developed during the chunking process. Use of NVivo software to assign codes to the qualitative data will enable us to access data on a specific topic quickly and organize information in

different ways to identify themes and compile evidence supporting them. As additional themes emerge, we will expand and refine the codes in an iterative process during the coding exercise and subsequent analysis of the coded transcripts. Further, the software will enable us to categorize respondents by gender, age, geographic location, or other salient characteristics to facilitate analysis by subgroup, which will allow us to identify divergent and common perspectives among different groups. For instance, students in rural areas may have different experiences with completing the program and securing employment relative to students in urban areas. At the end of the detailed coding process, we will chart the findings into a matrix to strike a balance between reducing the data to a usable amount and retaining the original meaning of the text.

2. **Data interpretation and writing**. We will be analyzing multiple data sources to answer each research question, so data interpretation and writing will require data triangulation to identify consistency and discrepancies in findings across data sources. This process will help confirm patterns or findings across data sources and identify important similarities and differences among them.

D. Outcomes analysis

While no longer a major component of the evaluation, our team will use any quantitative data we gather to assess the extent to which short and medium outcomes are met by this program. The analysis aims to shed light on potential benefits from the investments in the TVET centers. It is our understanding that GOPA is collecting M&E indicators as part of the TVET activity. We have requested GOPA's M&E data in spring 2020 and plan to send another request for M&E data before the end of their contract in late 2020. We will also request institution-specific data from the TVET centers, as listed in Table IV.5. We hope to obtain data on all these indicators at a quarterly frequency from 2017 to the end of the project, to capture longitudinal data throughout the implementation periods (2017-2020).

Data sources. As indicated above, the outcomes analysis will draw primarily from administrative data collected through the GOPA and MCC M&E plans, data on number of instructors trained, student enrollment and completion data from the TVET Centers (provided program completion occur during the timeframe of the evaluation). We plan to conduct two rounds of data collection. The first round has already collected the indicators data in spring 2020 to estimate whether GOPA is on track to meet its targets. The second round will collect indicator data before the end of GOPA's contract. This initial data collection will allow our team to understand any potential trends and look at the potential for drawing comparisons of data from before the program to after students graduate. As part of the key informant interviews with businesses, we will discuss the extent to which the TVET curricula aligns with the labor market demands and whether they believe students graduating from the TVET centers will meet the labor market demands. If the timeline allows, we will conduct observations of classroom instruction to determine to what extent instructors demonstrate the new skill sets covered by the TVET training. Table IV.6 provides a detailed summary of the quantitative and qualitative data we plan to collect through site visits, the survey, interviews and focus groups as part of the outcomes study.

Table IV.5. Key statistics on GOPA MINEDUC and GOPA ENCA program operations across the six departments in Guatemala

Indicator Type	Indicators	Data Source	Baseline	CED Target	Notes
Outcome	Graduates from MCC-supported education activities	GOPA/MCC reporting indicators	0 (2017/18)	420 (2021/22)	295 MINEDUC and 125 ENCA
Outcome	Students participating in MCC-supported education activities	GOPA/MCC reporting indicators TVET Centers	0 (2017/18)	597 (2020)	472 MINEDUC and 200 ENCA
Outcome	Employed graduates of MCC-supported education activities	GOPA/MCC reporting indicators TVET Centers	0 (2017/18)	147 (2022/23)	35% of graduates
Output	Instructors trained	GOPA/MCC reporting indicators	0 (2017/18)	220 (2020)	150 ENCA and 70 INTECAP
Output	Legal, financial, and policy reforms adopted	GOPA/MCC reporting indicators	0 (2017/18)	3 (2020)	
Process	National and departmental working groups with the private sector	GOPA/MCC reporting indicators	0 (2017/18)	85 (2020)	
Outcome	Number of centers with one cohort with at least one vocational program	GOPA/MCC reporting indicators	0 (2017/18)	14 (2020)	
Output	Number of certificate programs with guides and textbooks completed	GOPA/MCC reporting indicators	0 (2017/18)	9 (2020)	
Outcome	Gender parity index in new certificate programs	GOPA/MCC reporting indicators	0 (2017/18)	1 (2020)	
Outcome	Education centers linked with enterprises	GOPA/MCC reporting indicators TVET Centers	0 (2017/18)	14 (2020)	
Process	Teachers enrolled in TVET technical training	GOPA/MCC reporting indicators TVET Centers	0 (2017/18)	220 (2020)	150 ENCA and 70 INTECAP

E. Multi-case study analysis

The third component of the performance evaluation is a **multisite case study**, which will highlight program elements that successfully meet the intended outcomes. Multisite case studies are an opportunity to gain an in-depth understanding of the implementation of Activity 2 across the 14 target education centers. We will work with MINEDUC, PRONACOM, and MCC to identify 3 GOPA MINEDUC and one ENCA TVET institutions with careers that are representative of the revised programs being offered and focus our study on this group of institutions. To obtain a diverse sample of TVET institutions, we will seek to include urban and rural institutions of varying sizes and with varying conditions of infrastructure that offer a range of programs of study. We will work closely with GOPA implementers to understand the full

range of characteristics for the institutions and ensure we sample as diversely as possible. Our goal is to include three MINEDUC centers implementing careers in hospitality, transportation, and informational technology, and the ENCA center implementing careers in agroindustry.

The data for the case studies will come from the implementation and outcomes analysis described in the previous sections of this report. We will focus on information about development of new careers, efforts to recruit students, enrollment, financing, business relationships, and the potential opportunities for the placement of students in sector-specific employment. Data from the students will include the class of 2019 (which will graduate in November 2021 provided schools reopen and students are promoted to the next school year), and students from future cohorts (provided they enroll in the TVET programs during the timeframe of this evaluation).

We will complement these data with in-depth case studies of the implementation of Activity 2 in the target institutions. We will use characteristics of the TVET institutions (for example, enrollment in occupational families and completion of the program) to select 2-3 cases that successfully implement the interventions and highlight elements of successful school to work transitions. We will include questions in our implementation study protocols to probe on the types of issues we want to highlight in the case studies. We will also draw on relevant administrative data to show any trends in enrollment, gender parity, and graduation.

Table IV.6 presents a comprehensive summary of the qualitative data we plan to collect through interviews and focus group discussions as part of the mixed-methods performance evaluation. We will ask our respondents about topics that relate to multiple aspects of the program; in the table, we have aggregated all these so that each respondent is listed only once. In total, we plan to conduct approximately 30 interviews and 16 focus group discussions across all three performance evaluation components.

Table IV.6. Summary of primary qualitative data collection for the performance evaluation

Data sources	Type of data	Approximate number	Evaluation component	Illustrative areas of focus for interview and focus group protocols
MCC	Interview	3	• Implementation study	• Rationale for design of the new occupational families • Facilitators of implementation • Barriers to implementation • Perceptions of future outcomes • Potential for sustainability
PRONACOM	Interview	3	• Implementation study • Outcomes analysis	• Rationale for and input in the design of the new occupational families • Implementation progress • Facilitators of implementation • Barriers to implementation • Perceptions of outcomes • Potential for sustainability
GOPA	Interview	5	• Implementation study • Outcomes analysis	• Input into TVET program design and alignment with labor market • Resource investment and utilization • Process of implementation • Progress towards goals and objectives • Facilitators of implementation • Barriers to implementation • Interaction with businesses • Enabling environment including political will and institutional frameworks • Critical elements for success • Potential for sustainability • Availability of administrative data
DIGECUR, DIEGECADE, DIGEBI, DIGEX	Interview	4	• Implementation study	• Importance of TVET interventions • Potential for improvements to labor force • Perspectives on political will, enabling environment, and institutional frameworks • Perspectives on targeted occupational families • Perspectives on organizational capacity to continue TVET improvement • Perspectives on sustainability and change

Table IV.6 (*continued*)

Data sources	Type of data	Approximate number	Evaluation component	Illustrative areas of focus for interview and focus group protocols
TVET directors	Interview Survey	8 All	• Implementation study • Outcomes analysis • Case studies	• Perspectives on new curriculum and its alignment with the labor market • Perspectives on targeted occupational families • Perspectives on the new skills demonstrated by instructors • Enrollment in the new careers • Facilitators of implementation • Barriers to implementation and future sustainability • Relationship with business partners • Role of business partners vis a vis the new program • Strengths and weaknesses of relationship with businesses • Potential for student completion • Potential for student transition to workforce and meeting labor demands • Potential for improved salaries
TVET instructors	Focus group	7	• Implementation study • Outcomes analysis • Case studies	• Perspectives on new curriculum and its alignment with the labor market • Perspectives on the training program, teacher guides and student textbooks • Perspectives on targeted occupational families • Perspectives on the access to equipment and supplies • Enrollment and completion • Facilitators of implementation • Barriers to implementation and future sustainability • Relationship with business partners • Role of business partners vis a vis the new program • Student engagement in program • Student skill sets and the extent to which students demonstrate the skills required to graduate • Potential for improved student transition to workforce • Potential for improved salaries
TVET students	Focus group	7	• Implementation study • Outcomes analysis • Case studies	• Perspectives on new curriculum and student textbooks • Selection of occupational family • Strengths and weaknesses of the program • Engagement with business partners • Student engagement in program • Student skill sets • Potential for improved student transition to workforce • Potential for improved salaries

Table IV.6 (*continued*)

Data sources	Type of data	Approximate number	Evaluation component	Illustrative areas of focus for interview and focus group protocols
Participating businesses	Interview	8	• Implementation study • Outcomes analysis • Case studies	• Involvement in the new curriculum design and its alignment with the labor market • Facilitators of implementation • Barriers to implementation and future sustainability • Relationship and interactions with TVET Centers • Role of business partners vis a vis the new program • Student engagement with business partners • Student skill sets • Potential for improved student transition to workforce and meeting labor demands • Potential for improved salaries

1. Timeline

The primary data collection for the implementation study and case studies will take place beginning in March 2020 through March 2022 as we adjust to the global pandemic and move between virtual and in-person data collection (see Figure IV.1). An initial round of data collection focused on M&E data and key qualitative interviews with implementers, MCC staff, PRONACOM, key Ministry officials from the previous administration, and teacher and student focus groups will take place during the fourth quarter of 2020 (October-November 2020). Analysis of secondary data sources will take place from the last quarter of 2019 through most of 2020 (October 2019 through November 2020) when GOPA submits their final report. We hope to conduct student focus groups in 2022 with the cohort slated to graduate that year. Those interviews will be conducted either at the end of 2021 or the beginning or 2022 depending on the global pandemic situation. We will submit the final report in the last quarter of 2022 (October 2022).

Figure IV.1. Timeline of key project, evaluation, and report activities

	2019				2020				2021				2022			
Activity	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Qualitative data collection (implementation)																
Conduct document review			■	■	■	■	■	■								
Primary data collection (interviews with implementers and former Ministry staff, focus groups with teachers and students, possible observations)						■	■	■	■	■	■	■	■	■		
Data analysis*						■	■	■	■	■	■	■	■	■		
Outcomes analysis																
Conduct administrative data collection, interviews, and focus groups with teachers and students)								■	■	■	■	■	■			
Data analysis and writing									■	■	■	■	■	■	■	
Develop Performance Evaluation Report																
Develop **implementation executive summary** for MCC															■	
Submit Draft Performance Evaluation Report to MCC and stakeholders															■	
Presentation to MCC and MINEDUC																■
Final Performance Evaluation Report submitted																■

* Implementation data analysis will include follow up meetings with GOPA and MINEDUC and other relevant institutions that will continue implementing the program after the end of the Threshold program.

F. Challenges and limitations to data analysis

The nature of this evaluation presents several challenges and limitations for data collection and analysis. Here we highlight several of them and our plan for mitigating them:

1. **Inability to observe many short- and medium-term outcomes and attribute changes in outcomes to the TVET project during the timeline of this evaluation.** Given delays in the program design and implementation as well as course interruptions due to COVID-19, we will not be able to observe any impacts on labor market outcomes for TVET graduates. Therefore, we will refocus our evaluation mostly on analysis of the program implementation challenges and why the outputs were not fully achieved in the anticipated timeframe. Even for those outcomes related to enrollment and competition for which we might obtain longitudinal data, there is no comparison group against which to gauge changes in outcomes due to other factors; therefore, we have no way of knowing what would have happened in the absence of the TVET interventions and, thus, how much of any changes we do observe can be attributed to the project versus other factors. We will use triangulation between all our data sources to construct the most plausible explanations for any observed changes and use outcomes analysis to confirm or revise the project logic and show any potential changes to outcomes.
2. **Long recall period.** Four years will pass from project initiation to completion. We may encounter difficulties locating some of the people we would like to interview; even when we can connect with those on our list of respondents, we will be asking them to remember events that occurred potentially more than two years ago, so their recollections might be incomplete or inaccurate. Our team brings extensive experience working with and understanding project implementation. We will use anchoring techniques to remind interviewees of where they were and what activities were taking place during that time to ground their responses. We will also share summary information in advance of the interviews so that respondents will have primed their recall before the interview or focus group. We will pre-screen participants and try to identify strong candidates, as well as participants who knew each other during the project activities so that we build on information gleaned in each interview to help tailor the next one. This process will improve the quality of the qualitative recall data. Finally, we will request permission from the participants to follow up post-interview with a phone call or email to them so that when we learn new information from another respondent, we can triangulate it with earlier respondents, potentially jogging memories and fleshing it out.
3. **Respondent Bias.** Respondent bias is a general research term that refers to factors that may influence a participant's responses to a survey or interview question. These factors can lead to nonrandom deviations of the answers from the true value (http://methods.sagepub.com/reference/encyclopedia-of-survey-research-methods/n486.xml, cited in February 2019). Our team brings extensive experience dealing with respondent bias on evaluations. We will follow a series of steps to mitigate this issue in our evaluation. First, we will triangulate our data. We will ask the same questions across respondent groups, and stakeholders and collectively analyze the data to create a picture of the situation while recognizing the different perspectives each stakeholder may bring to the table. Second, we will use quantitative data (when possible and relevant) to document and ground the

qualitative responses. Finally, we will ask the same question in different ways to each stakeholder and then compare the answers during analysis to look for consistency and accuracy in the responses.

4. **End of Threshold agreement.** The MCC Threshold Agreement ends in 2020, which means that PRONACOM will not be able to assist Mathematica with ensuring that the TVET institutions and relevant Ministry of Education units collect the needed indicator data for the endline data analysis. Mathematica is in the process of putting together a memo to MCC that details the data we will need for all three components of the Guatemala Threshold Education Program Evaluations. For this evaluation, we will need the TVET institutions to provide the following preliminary list of post-compact indicator data:

   4.1. Number of TVET institutions that initiate the first cohort in the new occupational families, disaggregated by department.

   4.2. Number of TVET institutions that initiate the second cohort in the new occupational families, disaggregated by department.

   4.3. The number of students enrolled in the new careers, disaggregated by year, sex, ethnicity, and department.

   4.4. The number of students in the first cohort that graduate from the TVET institution, disaggregated by course, sex, and department.

   4.5. The number of students in the second cohort that graduate from the TVET institution, disaggregated by course, sex, and department.

   4.6. The number of students in the first cohort that acquire jobs in the field/sector they trained for under the TVET program, disaggregated by sector, institution, sex.

   4.7. The number of students in the second cohort that acquire jobs in the field/sector they trained for under the TVET program, disaggregated by sector, institution, sex.

   4.8. The number of students who complete internships within the public or private sector during their coursework, disaggregated by institution, type of internship, sex of student.

   4.9. Starting salary for students who acquire new employment after graduation (if available from hiring businesses).

   4.10. Number of jobs posted through formal avenues (e.g. Labor market information systems), in the target sectors.

The details of who will provide the data, timelines, and additional indicators was provided to MCC in an official memo in April 2020. We will provide an updated indicator request before the end of GOPA's contract in late 2020.

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V. ADMINISTRATIVE

Mathematica is committed to protecting the rights and welfare of human subjects and will prepare and submit an application for approval of the research and data collection plans to an institutional review board (IRB) registered with the Office for Human Research Protections, U.S. Department of Health and Human Services. We intend to use Health Media Lab as our IRB because of our positive experience with it on other MCC projects. For each IRB application, we will submit a set of required documents, including a research protocol providing details of the study and data collection activities, copies of all data collection instruments, and a completed IRB questionnaire summarizing the key elements of the research protocol and plans for protecting participants' confidentiality. The data collection instruments that we will prepare and submit to the IRB will include consent statements approved by MCC that guarantee the confidentiality of respondents to the extent possible.

We will provide evidence of IRB approval to MCC. IRB approval is valid for one year, and we will submit annual renewals for subsequent approvals as data collection proceeds through follow-up collection processes. We expect the annual renewals to require only minimal updates to the core application materials because we will be collecting similar data from year to year. If data collection instruments change substantially from those approved by the IRB, we will reapply for review. Small changes to the instruments (such as rewording of questions, reordering of questions, or editing changes) do not require reapplication, but the finalized instruments must be submitted to the IRB for documentation. We will submit the instruments for review in both English and Spanish. We will collaborate with the local data collection firm to obtain approval for conducting fieldwork from the local IRB in Guatemala.

A. Data protection

Mathematica and the local data collection firm will ensure confidentiality of all data collection respondents, including confidentiality of data collection participation, confidentiality of personally identifiable information, and confidentiality of other sensitive data. The data collection instruments (both the quantitative instruments and qualitative protocols) will include consent statements approved by MCC that guarantee the confidentiality of respondents to the extent possible. If data is collected on paper instruments, the local data collection firm will ensure the safe handling and transport of the instruments from the field to the main office for data entry where the instruments will be stored in lock-and-key cabinets. If data is collected electronically (which is our preferred approach), it will be stored on a secure server approved by Mathematica. The data collection firm will share electronic data files with Mathematica via a secure file transfer system, such as a file transfer protocol (FTP), file exchange website (FX or BOX site). The data will be stored on a secure Mathematica server and will be accessible only to project team members who use the data. All project team members have signed a nondisclosure agreement pertaining to confidential information. For internal control and audit purposes, the local data collection firm will retain the data files, both in paper and electronic form, for the entire duration of the project, which includes the base contract and the subsequent option contracts. All collected data and databases are the property of Mathematica and will be delivered to Mathematica at the end of the contract.

B. Preparing data files for access, privacy and documentation

Public-use data will enable any stakeholder, researcher, or agency to understand the source data and analysis behind MCC evaluations and might inspire a wide range of new policy-relevant research, maximizing the benefits of MCC's investments in large-scale data collection efforts in developing countries. The Mathematica team will prepare public use quantitative data files following MCC's Evaluation Microdata Guidelines and will deliver complete data packages for the MCC Evaluation Catalog. In addition to de-identified quantitative data files, we will provide users' manuals and codebooks according to the most recent guidelines set forth by MCC. Public-use data files will be free of personal or geographic identifiers that would enable unassisted identification of individual respondents or their households, and we will remove or adjust variables that introduce reasonable risks of deductive disclosure of the identity of individual participants. We will also recode unique and rare data by using top and bottom coding or replacing affected observations with missing values. If necessary, we will also collapse into less easily identifiable categories any variables that make an individual highly visible because of geographic or other factors.

Unlike quantitative data, which is straightforward to anonymize, many of the key informants and focus group participants who will be invited to participate in the qualitative data collection may have a unique perspective (for example, as the leader of a certain institution). We might need to make substantial changes to the transcripts to protect these respondents' identities. These modifications to the transcripts might render them less valuable as a public good, but without such protections, respondents would be unlikely to offer complete and honest answers to questions that are essential to the evaluation. If we provide public use versions of the transcripts without adequate anonymization, participants could be at risk of social or professional repercussions if powerful institutions or individuals learned of negative comments made during the interviews. We will attempt to redact focus group discussion such that no identifiers will remain that could be used to link respondents to their comments. We do not, however, believe this is possible with respect to key informant interviews. We will seek IRB's guidance and advice on how to balance MCC's desire for data accessibility with the need to protect respondents' identities.

C. Dissemination plan

The Mathematica team will present evaluation findings in person at MCC headquarters and at MINEDUC. We will also participate in any other MCC-financed dissemination and training events related to the findings from the final performance evaluation report. To ensure that the results and lessons from the evaluation reach a wide audience, we will work with MCC to increase the visibility of the evaluation and findings within the education sector, particularly for policymakers and practitioners. We expect the broader research community to have a strong interest in the evaluation findings. To facilitate wider dissemination of findings and lessons, we will collaborate with MCC and other stakeholders to identify additional forums—conferences, workshops, and publications—for disseminating the results and will encourage other donors and implementers to integrate the findings into their programming.

D. Evaluation team roles and responsibilities

Our team has extensive experience and expertise in evaluation design, data collection, and analysis and therefore will be able to meet MCC's evaluation needs. **Dr. Audrey Moore** oversees the project team and provides technical leadership. She is responsible for managing the evaluation team, leading the design and implementation of the evaluations, and overseeing quantitative and qualitative data collection. Dr. Moore also monitors the project's budget and schedule and manages communication with MCC, local partners, and other stakeholders. **Dr. Sarah Liuzzi** assists Dr. Moore as senior analyst, overseeing the quality of data collection in the field and working on the design of the performance evaluations and analysis. **Ms. Galina Lapadatova**, junior analyst on the team, assists with conducting the project's evaluability assessment and design report and will support other evaluation activities, particularly data collection in the field and data analysis.

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Annex I

Documentation of changes to the evaluation design of the GTEP TVET activity.

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The following annex documents the changes and requests made to the evaluation design for Activity 2: Performance evaluation of TVET.

Date	Requested change	Action taken
October 31, 2019		Submission of the original EDR in alignment with the design Mathematica proposed in our proposal/contract.
December 4, 2019	MCC stakeholder comments received by Mathematica. Field comments to follow the following week.	Mathematica begins making revisions and reads the MCC document written by Ryan Moore on the lessons learned across TVET evaluations.
February 19, 2020	Major restructuring of the EDR to focus on 1. Assessing the existence of labor market gaps/mismatches/etc to justify the investment in TVET/skills in the first place or whether or how it informed program design. 2. Measuring the impacts on student wages, job acquisition, and learning.	Meeting held with Ryan Moore and Pamela Velez-Vega to share lessons learned and recommendations for how to proceed in revising the EDR.
April 15, 2020		Mathematica submits the revised EDR.
May 13, 2020	Received additional comments and feedback from Ryan Moore and Carlos Garguilio. The comments included: 1. Updates to cohort sizes, timeline of activities, and standardization of language in the report. 2. Improve the design to demonstrate: 1) whether we should expect labor market impacts, and more importantly 2) whether any observed uptick in employment rates may simply be displacing others from those jobs (ie. potentially no increase or only marginal increase to productivity) 3. Add more detail on the data collection timeline, process, and focus.	Mathematica begins making additional revisions to the EDR
May 14, 2020	Mathematica receives concerns via email from the country director John Wingle about the effect of implementation delays on our ability to execute the new evaluation.	Mathematica holds on making any additional changes until we receive the comments in writing from John Wingle.

Date	Requested change	Action taken
May 18, 2020	Mathematica received more detailed comments related to the affects of implementation delays and requests a meeting to discuss changes to the EDR. In the email, John Wingle noted, "Due to implementation delays and other problems in this activity, there will not be any impact on labor market outcomes for TVET graduates in the time horizon of the evaluation. In fact, there will not be any TVET graduates in the timeline of the evaluation." He also noted that the technical degrees have not been implemented due to lack of trained teachers, materials, and equipment, which are being developed now, but will not be implemented in time for the evaluation to detect changes in outcomes. John Wingle suggested changes to the evaluation questions, which we agreed to discuss in a telephone conference.	Mathematica reviews concerns and sets up a meeting with MCC.
May 21, 2020		Mathematica meets with John Wingle, Pamela Velez-Vega and Jennifer Heinz to discuss changes.
May 27, 2020	The proposed final evaluation questions requested focus on the three main areas of MCC interest: Attainment of outcomes, fidelity of implementation and allocation of resources. Below are the questions we discussed with MCC. 1. To what extent do the TVET program curricula align with labor market demands? 2. To what extent do businesses believe students enrolling in TVET centers will meet labor market demands? 3. To what extent do teachers in the TVET system demonstrate new skill sets covered by the MCC-supported TVET training? 4. To what extent do MINEDUC and ENCA have the organizational capacity (e.g. human, institutional) to continue implementing and improving the TVET system? What aspects of the institutions need further strengthening? 5. Have new and improved TVET teacher training programs been able to recruit enough participants (limited to 35 due to room and instruction constraints)? 6. How did the sectoral studies, roundtables, and meetings influence the design and implementation of the TVET program? 7. To what extent were the teacher guides and student textbooks completed and provided to TVET institutions? a. How do the new materials align to the curricula? 8. To what extent do students have access to the equipment and supplies (i.e. at school, work, home) required to practice and apply what they learn? 9. To what extent do students in the program demonstrate the skills required to graduate and receive certification? 10. How is labor market information obtained and used to develop TVET programs and careers or determine which TVET programs and careers to provide to students?	Mathematica submits a draft table with the revised evaluation questions based on the meeting with MCC.

Date	Requested change	Action taken
May 27, 2020 (cont.)	11. What gender differences exist in TVET enrollment across occupational families? How have the differences changed over time? a. To what extent has gender-sensitive job counseling contributed to the perception that females now have access to a wider range of employment opportunities? 12. What kinds of interactions are taking place between TVET programs and employers? a. What is the frequency and quality of these interactions? Are they meaningful or just part of checking a box? 13. How were resources invested during the program relative to inputs and short- to medium-term outcomes? To what extent could resource utilization have been improved?	
June 2, 2020	MCC PM requests that we add a justification to the table for why Mathematica believes that we cannot complete the cost analysis work related to one of the evaluation questions requested by MCC.	
June 19, 2020		Mathematica submits the revised table with the justifications.
June 25, 2020	Mathematica holds meeting with MCC staff, Pamela Velez-Vega and Jennifer Heinz to discuss options for measuring cost-effectiveness	Mathematica agrees to look at cost-effectiveness based on proposed budget and outputs.
July 24, 2020		Mathematica submits a substantively redesigned evaluation design based on the agreed on questions listed in the design report.

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