Guatemala Education Project Baseline Report

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ACRONYMS

DIGEDUCA	Dirección General de Evaluación e Investigación Educativa
DIGEMOCA	Dirección General de Monitoreo y Verificación de la Calidad
DIPLAN	Dirección de Planificación Educativa
GEP	Guatemala Education Project
ICT	Information, Communication, and Technology
INE	Instituto Nacional de Estadística
IPC	Strengthening of Institutional and Planning Capacity
ITT	Intent to treat
LAC	Latin America and the Caribbean
LATE	Local average treatment effect
M&E	Monitoring and evaluation
MCC	Millennium Challenge Corporation
MDES	Minimum detectable effect size
MINEDUC	Ministry of Education
PEM	Profesorado de Educación Media
PADEP/CB	Programa Académico de Profesionalización Docente del Nivel Medio/Ciclo Básico
RCT	Randomized-controlled trial
SBM	School-based management
SD	Standard deviation
TOC	Theory of change
TVET	Technical and Vocational Education and Training
USAID	United States Agency for International Development
WASH	Water, Sanitation, and Hygiene

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EXECUTIVE SUMMARY

The Government of Guatemala (GoG), sponsored by the Millennium Challenge Corporation (MCC), created the threshold program to strengthen the quality of secondary education and youth workforce development and to improve tax and customs administration to attract private investment.

The Guatemala Education Project (GEP) is one of two activities implemented under the threshold program. GEP is executed by the National Competitiveness Program (PRONACOM, for its name in Spanish) and has three components: (1) *Exito Escolar* (Educational Success, in English), (2) technical and vocational educational training (TVET), and (3) institutional planning and capacity-building. Éxito Escolar is designed to strengthen the competencies of educators and promote an equitable access to high quality lower secondary education, improve student academic performance, and increase transition rates from lower to upper secondary education. The second component, TVET, aims to address the misalignment between youth's skills and the needs of employers in the labor market through curriculum reform, strengthened relationships with the private sector, and teacher training. The TVET activities focus on four sectors: hospitality; information, communication, and technology; transportation; and agriculture. The third and last component of GEP focuses on strengthening the institutional and planning capacity (IPC) of the Ministry of Education in Guatemala (MINEDUC). Implementation of components one and three is led by FHI360. GOPA is the implementing organization for the TVET activities. This report presents the findings from the *Exito Escolar* baseline (Chapters I to VIII) and the implementation study of IPC (Chapter IX).

Éxito Escolar

Mathematica is conducting a mixed-methods evaluation of Éxito Escolar, which includes an *impact study* with a randomized-controlled design and a *performance evaluation* that draws on qualitative methods. The goals of the evaluation are to estimate the impact of the program on students' academic outcomes and understand the factors that facilitate or hinder the implementation process.

Baseline Impact Study

Mathematica and its data collection partner, Espirilica, conducted baseline data collection for the impact study between May and July 2018. The data collection sample included 331 lower secondary schools, which were randomly selected to participate in the evaluation. The team collected data from grade 7 students, directors, and teachers from each of the 331 schools. The purpose of the baseline was to (1) assess whether the treatment and control groups are balanced (or similar), on average, across a number of observed characteristics, and (2) identify initial differences between the two groups.

Baseline findings reveal that, with few notable exceptions, the treatment and control groups are balanced on nearly all observed characteristics and in most characteristics considered predictive of students' academic performance. Key findings are described below.

School characteristics

- Lower secondary schools in the treatment and control groups are similar across most characteristics observed, including the number, gender, and language of students, and school directors' and teachers' level of education and experience.

- Although the two groups are largely equivalent across most characteristics, there are noteworthy differences in school modalities. Twenty-one percent of schools in the treatment group are National Institutes of Basic Education (INEB, Instituto Nacional de Educación Básica, in Spanish), compared to 11 percent in the control group. Approximately 43 percent of schools in the treatment group are distance education schools (Telesecundaria, in Spanish) compared to 54 percent in the control group. While these differences likely occurred by chance, the differences are statistically significant (at the 5 percent level) and relatively large. These differences could make it difficult to attribute potential differences between the groups to the Éxito Escolar activity.

- We also found that the school infrastructure in the treatment group schools is in slightly better condition than in the control group schools. Specifically, there are marginally significant differences (at the 10 percent level) relative to lighting (41 percent of treatment compared to 51 percent of control schools reported insufficient lighting), ventilation and temperature (54 percent of treatment compared to 63 percent of control schools reported temperature and ventilation problems), and exterior noise (26 percent of treatment compared to 36 percent of control schools reported issues with exterior noise)– all elements that affect student learning according to the literature.

Socio-demographic characteristics of students and teachers

- There are no statistically significant differences in the socio-demographic characteristics of grade 7 students across the treatment and control groups.

- Teachers across the treatment and control groups are equivalent in terms of gender, native language, level of education, and years of teaching experience.

- Communication teachers in the treatment group reported greater participation in learning communities than teachers in the control group, but participation levels in both groups are generally low (9 percent and 4 percent, respectively).

Pedagogical practices

- There are no statistically significant differences between the treatment and control groups in teachers' use of time in the classroom and instructional materials, with one exception - mathematics teachers in the treatment group spent significantly nearly four percent less time less time using books than teachers in the control group.

Figure ES.1. The average percentage of class teacher used materials, by treatment group
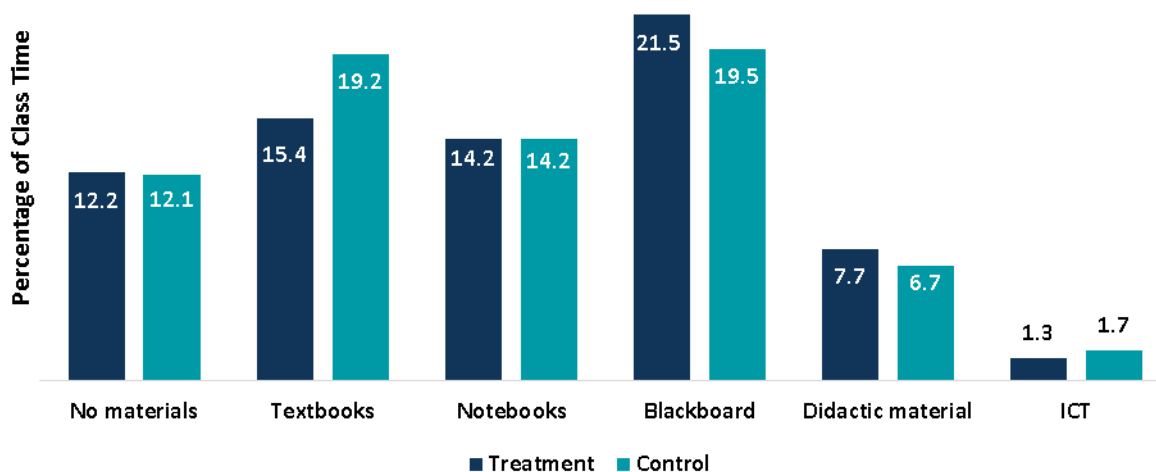
Note: The figure shows arithmetic means from descriptive statistics. We did not perform significance testing for differences between groups given the low frequencies for some of the categories.

Student academic performance

- Students' performance on the mathematics, natural sciences, and language assessments is equivalent between the treatment and control groups. Because academic performance is the main outcome of interest for the study, it is important that the treatment and control groups are similar at baseline.

- On average, 7th graders in the treatment and control groups answered less than half of the questions correctly for the three subjects. The finding confirms that student performance in lower secondary school is low and many students are behind grade level.

- Student performance was lowest in mathematics than in the other subjects. Students in both the treatment and control groups correctly answered only about one-third of the questions in mathematics, about 37 percent in natural sciences, and 44 percent in language.

- The treatment and control groups are balanced in terms of school enrollment, repetition, and dropout rates. However, we find a significant difference in promotion rates. Students in the control group were four percentage points more likely to be promoted to the next grade than students in the treatment group.

Figure ES.2. Percent correct responses in the academic assessment, by subject and treatment group
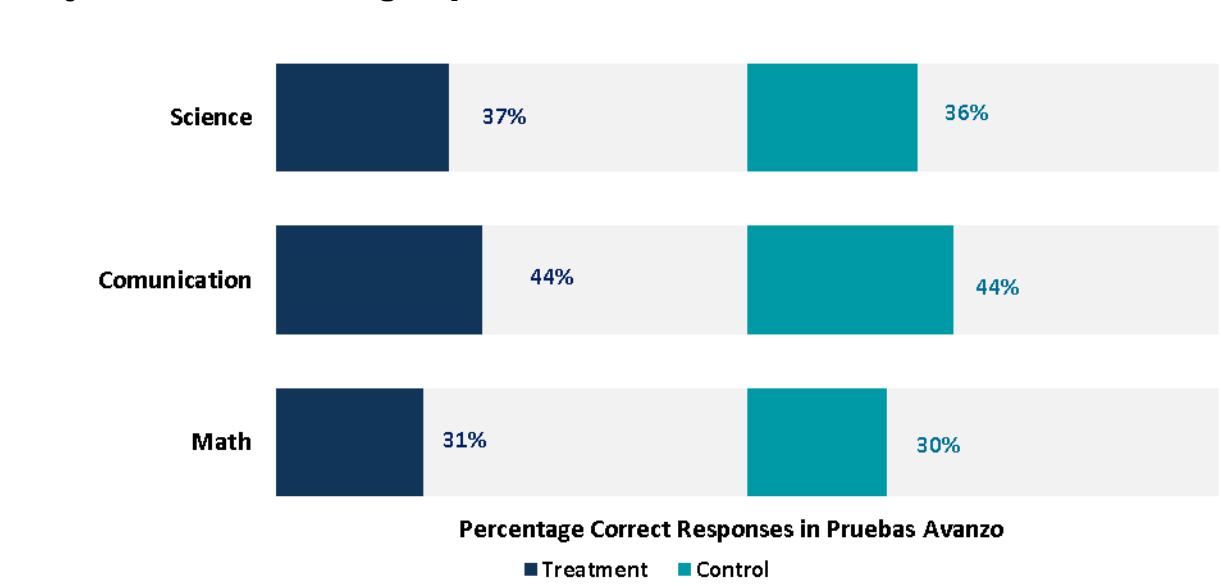
Because this study relies on a randomized design, the differences we find in the distribution of school modalities, the use of instructional materials, and in other characteristics are likely due to chance. Mathematica will use statistical adjustments and sensitivity analysis to minimize the impact of these differences. Statistical adjustments consist of including some of the variables in which we found large differences at baseline in the impact estimation models. The inclusion of these variables ensures that the estimated impacts reflect the effect of the intervention, and not initial differences between the groups.

Implementation study of Exito Escolar

The first round of data collection for the implementation study of Éxito Escolar took place in March 2019. We conducted 26 interviews with stakeholders at MINEDUC, FHI360 (the implementing organization), instructors from the three universities delivering the teacher training program, and school directors. We also conducted 54 focus groups with teachers, students, and parents in 15 lower secondary schools in five departments. The goal of this first round of data collection was to describe progress made during the first six months of implementation and identify the main facilitators of and barriers to the implementation process.

We find that FHI360, in collaboration with MINEDUC and PRONACOM, made important progress towards the short- and medium-term objectives from the theory of change for Éxito Escolar. For example, the academic proposal for the *Program for Professional Development of Lower Secondary Teachers* (PADEP/CB, for its name in Spanish) was designed and approved; the diagnostic test was administered to 1,552 teachers enrolled in the program; the universities in charge of implementing the PADEP/CB were contracted and trained; and 1,913 teachers participated in PADEP/CB in the first semester. In addition, FHI360 contracted and trained 55 pedagogical advisors and 37 management advisors who started to implement visits to schools and to support teacher learning communities.

Despite these important accomplishments, Éxito Escolar experienced some difficulties that resulted in substantial implementation delays. Specifically, PADEP/CB started six months later than planned due to changes in the structure and scope of the program (shift from diplomado to profesorado), difficulties procuring the implementing universities and recruiting enough teachers and school directors to participate in the program. Additionally, the school networks had not been formed at the time of data collection, and activities with parent organizations had only recently started. Table ES.1 summarizes key characteristics of the implementing organizations, participating teachers, and the PADEP/CB itself, which have facilitated or hindered the implementation process.

Table ES.1. Facilitators and barriers for the implementation of Éxito Escolar

	Facilitators	Barriers
Implementer characteristics	PRONACOM and FHI360 have institutional support from MINEDUC and its directorates, who have mobilized human and material resources in support of the program	The need to coordinate multiple organizations (PRONACOM, FHI360, MINEDUC, the Universities, etc.) has resulted in implementation delays
	MINEDUC established a high-level working group to coordinate the activities of participating entities	Information needed to implement the program is not always communicated effectively at all levels
	FHI360 has made adjustments to respond to the needs of teachers enrolled in the program	The autonomy and differences between the three universities make it difficult to maintain adherence to the program's design and quality standards
		Some university instructors are not experts in the subjects they teach.
Teacher characteristics	Teachers participating in PADEP/CB value the opportunity to obtain a specialization	Some university instructors consider that PADEP/CB will not be enough to sufficiently prepare teachers who lack basic knowledge of their subject matter
	Accessing professional development opportunities without having to pay for the cost of tuition is a key motivating factor for teachers	Teachers' job insecurity may mean that some students will not be exposed to trained teachers for the intended amount of time, potentially reducing the likelihood change in student academic outcomes
	Teachers are eager to put in practice in the classroom what they are learning in the program	Little familiarity with the program's online tools (and with technology in general) and the financial burden of accessing online tools discourage teacher engagement=
PADEP/CB characteristics	PADEP/CB was designed with teachers' needs in mind, including filling gaps in teachers' basic knowledge of their subject matter	The program has a heavy academic load that teachers find difficult to balance with their personal and professional responsibilities
	Teachers consider the pedagogical methods they are learning in PADEP/CB more effective than traditional teaching methods	Because the program is being modified as it is implemented, participants and beneficiaries will not receive the full dosage of the program in its "best" form
	The fact that the program is free of charge is a key incentive for teacher participation and retention	

Institutional Strengthening and Capacity Building (IPC)

The IPC activity focuses on improving MINEDUC's institutional capacity to plan and budget so that it can provide an equitable, high quality secondary education. The component includes three main activities: (1) the use of service standards to improve planning and budgeting processes, (2) teacher recruitment and selection, and (3) strengthening decision support systems and developing the technical capacity necessary to implement the standards-based planning model.

Mathematica is conducting a performance evaluation that includes a trend analysis and a qualitative study. To analyze the IPC data, we employ Political Economy Analysis (PEA) and a Drivers of Change framework that allows us to look at incentives, power structures, and facilitators and barriers to policy change over time. The evaluation will produce lessons learned about the contributions of technical assistance and capacity building to education policy, political will, institutional frameworks, and agents of change. Data for the IPC activity will be collected multiple times over the next two years so we can document and explain the change process.

The purpose of the first round of data collection in a political economy analysis is to understand how the current decision-making system is structured, who has decision making power, how stakeholders make decisions, how key agents interact, what the incentive structures are, and what the key barriers and facilitators of change are. Our initial interviews with 12 key program stakeholders reveal that the political will to create information systems that facilitate planning and budgeting processes is there, but there are increasing concerns about the capacity of individuals to maintain the systems. There is also growing concern about how upcoming elections could affect the political will to make changes in the system. Key findings include:

- A series of structural challenges may keep the project from fully realizing the potential of the new system for planning and budgeting. Structural challenges broadly refer to how institutions organize processes within and across the government. For example, high levels of poverty, historical patterns of marginalizing rural and indigenous populations, and the perception that public education is low-quality limits the impact of technical improvements in planning and budgeting on student participation rates and learning outcomes.

- The historically low levels of spending on the social sectors (including education) may limit the contributions of activities on quality and improved coverage for lower secondary education. Secondary education has not historically been a priority investment for the Government of Guatemala.

- The impending government elections may affect MINEDUC's ability to instill an evidence-based planning and budgeting process before the end of the threshold agreement. Political will and policy agendas may differ, and it will take time to help new policymakers understand the benefits the new systems can have for education.

- Several entities, including the Ministry of Finance, are not actively participating in the project and need to be part of the discussion if new planning and budgeting strategies are to be successfully institutionalized.

- There needs to be more focus on creating a planning culture within MINEDUC, which is currently missing from everyday practices. This type of change happens through long-term

engagement and peer-to-peer learning that can be provided by technical experts. Although the implementing organization is responsible for a series of deliverables and products, it is less clear that it plays a role in helping to shift perceptions and practices at all levels of MINEDUC.

- Uneven access to reliable telecommunications for synchronizing remote and centralized data and processes present a major structural hurdle to the successful creation of any of the new ICT systems for planning and budgeting.

- At the time that interviews were conducted with Ministry of Education experts (2018), the development and rollout of the new curriculum (CNB) appeared to have taken place without a full exploration of its impact on teacher appointment. It was not clear at that time whether incentives for change were in place, or that key stakeholders such as the teachers' union are engaged in the change process. Since that time, the implementing organization in partnership with MINEDUC has engaged the teacher unions in reviewing the new curriculum; initiated the development of a catalog of teaching positions; began preparing for a payroll audit; created Web interface for eSIRH, with general consultative functions for employees. Implementers have also worked closely with MINEDUC to help process a Ministerial Agreement on teacher recruitment, which passed through directions' review. These elements show that institutional change is underway and will improve the teacher selection and recruitment process in the future.

These findings show that two components of successful institutional change are in place - The political will to develop and implement the new systems exist in the current government, and technical assistance from international experts who are creating the appropriate manuals, databases, and systems to support MINEDUC. It is less clear that drivers of change such as legal frameworks, roles and responsibilities, and "how we do business" are changing to ensure a long-term shift in both how MINEDUC selects and recruits teachers and how it budgets for the needs of secondary education. Over the next few months, Mathematica will be collecting more data to develop our understanding of the incentive structures in these reform efforts, and to examine in more depth how MINEDUC institutionalizes these new systems over time.

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I.   INTRODUCTION

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 youth who could be enrolled in higher levels of education remain out of school and many of those enrolled in school have no access to high quality education. Although net enrollment in primary school was nearly 80 percent in 2017, in lower and upper secondary schools it was only 43 and 25 percent, respectively (INE 2018 with data from MINEDUC). Of the students who enroll in lower secondary education, only 56 percent complete *Ciclo Básico* (World Bank 2018 with data from UNESCO). According to Adelman and Szekely (2017), Guatemala has the lowest percentage in Central America of youth ages 25–29 who complete secondary education or above. Students' performance on learning assessments is also low. Among lower secondary graduates, only 18 percent met the achievement standards in mathematics and only 15 percent met the standards in reading in 2013. Among upper secondary graduates, only 9 percent met achievement standards in mathematics and 26 percent in reading in 2015 (Dirección General de Evaluación e Investigación Educativa [DIGEDUCA] 2016). As a result, the majority of Guatemalan youth ages 15 through 24 lack the foundational skills needed to enter the formal workforce (USAID 2015).

To improve secondary education and youth workforce development, the government of Guatemala partnered with the Millennium Challenge Corporation (MCC) through a threshold program. This report focuses on the Guatemala Education Project (GEP), which is one of two projects funded under the threshold program. GEP consists of reforms in the education sector, while the second project, which is beyond the scope of this report, centers on resource mobilization.

The GEP is organized around three activities: (1) the Quality of Education in Support of Student Success activity (*Éxito Escolar* in Spanish), which seeks to strengthen the competencies of educators to promote equitable, high quality secondary education; (2) the Technical and Vocational Education and Training activity (TVET), which supports the Ministry of Education (MINEDUC) in improving technical and vocational education and training; and (3) the Strengthening of Institutional and Planning Capacity activity (IPC), which strengthens the institutional capacity of MINEDUC. FHI 360 will implement Éxito Escolar and IPC.

MCC has contracted with Mathematica to evaluate GEP. The evaluation of Éxito Escolar focuses on understanding the impacts on student outcomes of the teacher professional development program (*PADEP/CB* for its name in Spanish*: Programa Académico de Profesionalización Docente de Nivel Medio/Ciclo Básico*). To complement the impact evaluation, Mathematica is conducting a performance evaluation, encompassing a qualitative implementation study of Exito Escolar and a political economy analysis of the IPC activity. The implementation study of Exito Escolar hopes to provide lessons learned related to how and why Éxito Escolar interventions affect the targeted populations in Alta Verapaz, Chiquimula, Jalapa, Sacatepéquez, and Sololá, the five departments targeted by the activity. The implementation study will also try to understand how the establishment of school networks and support to parent organizations, two additional efforts as part of Éxito Escolar, contributes to improving student transition rates from primary through upper secondary education. Our political economy analysis of the IPC activity provides lessons learned about the contributions of technical assistance and

capacity building on education policy as it relates to financing and using data for decision making in secondary education. TVET began later than the Éxito Escolar and IPC activities; we will report on our evaluation plan and baseline results for that activity in separate documents.

In the chapters that follow, we provide context for the evaluation and describe the results in further detail. In Chapter II, we provide an overview of GEP and review the program logic and geographic focus of the program. In Chapter III, we review the literature that grounds the GEP interventions and highlight any gaps that evidence from this evaluation can help fill in terms of informing what we know about what works in education. In Chapter IV, we review the design of the evaluation of the Éxito Escolar activity, including the research questions, sampling technique, and random assignment. Chapter V focuses on our data sources and outcome definitions. We present our findings in Chapter VI, including baseline equivalence on key characteristics, outputs, and short- and medium-term outcomes. We discuss the implications of the results for the impact evaluation in Chapter VII. Chapter VIII presents our mid-term implementation findings. Chapter IX includes an overview of the political economy analysis for the IPC activity, along with the results of our first round of interviews with stakeholders in Guatemala.

II. OVERVIEW OF THE GUATEMALA EDUCATION PROJECT

The objective of GEP is to support the government of Guatemala's ongoing institutional reforms as defined in the Proposal for the Transformation of Secondary Education (Asturia de Barrios 2014) and the *Ruta Crítica* (MINEDUC 2014). The objective of these reforms is to provide youth in Guatemala with high quality secondary education that prepares them to succeed in the labor market. GEP consists of three complementary activities. In this section, we describe the activities, sub-activities, beneficiaries, and geographic scope of two of those activities, Éxito Escolar and IPC.

The first element of GEP is Éxito Escolar, which supports MINEDUC's interventions to improve the quality of lower secondary schools (grades 7 through 9). The activity comprises four components, which are summarized below. The details for each component can be found in our evaluation design report (Felix et al. 2017).

1. **Professional development for teachers.** The GEP will offer 1,800[1] teachers the opportunity to participate in the *Program for Professional Development of Lower Secondary Teachers* (PADEP/CB for its name in Spanish: Programa Académico de Profesionalización Docente del Nivel Medio[2]). PADEP/CB is an intensive, 20-month training in pedagogic skills and content knowledge on language and communication (Spanish), mathematics, and natural sciences). Teacher participation in the program is voluntary.

2. **Pedagogic support and communities of practice.** GEP will train approximately 60[3] pedagogic support staff and 35[4] administrative support staff to help school directors and teachers at lower-secondary schools implement the new pedagogic and management techniques.

3. **Establishing school networks.** GEP will establish 100 new school networks that link at least five primary schools to one lower secondary school.

4. **Establishing/supporting parent organizations.** The original GEP plan aimed to establish parent organizations at the 100 lower secondary schools participating in the newly established school networks. However, after initial contact with schools, FHI360 found that most already had parent organizations. Instead of establishing parent organizations, the project will now focus on supporting existing parent organizations to develop action plans for the prevention of student dropout and to support student academic attainment.

In addition to these four activities, MCC is funding DIGEDUCA (Directorate of Education Evaluation and Research)[5] and DIGEMOCA (Directorate of Quality Monitoring and

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[1] Updated from the original goal of 2,400 teachers.

[2] The program was formerly known as Profesorado de Educación Media (PEM) and, before that, Diplomado.

[3] Updated from the original goal of 80 pedagogical support staff.

[4] Updated from the original goal of 40 administrative support staff.

[5] In Spanish, Dirección General de Evaluación e Investigación Educativa.

Evaluation)[6] in their efforts to develop and implement new student assessments called *Pruebas Avanzo.* DIGEDUCA designed and implemented *Pruebas Avanzo,* with support from DIGEMOCA, in the first half of 2018 and are in the process of further developing these assessments (funded separately by MCC) to measure student outcomes in language and communication, mathematics, and natural sciences. Mathematica is using the results of these tests to establish equivalence between the study groups and to measure the impacts of the interventions at endline. DIGEDUCA will collect a second round of test data from March 14 to April 12 of 2019.

The main beneficiaries of Éxito Escolar are students who might obtain an increase in their economic wellbeing as a result of the MCC investment. This includes students who transition from primary to lower secondary school, those who graduate from lower secondary school, and those who might reenroll after dropping out of school. Other potential beneficiaries include students' younger siblings (who might be enrolled in primary school and might be encouraged to pursue lower secondary education) as well as other household members who are likely to benefit from the future increase in income by one household member.

The program engages a diverse group of participants, including university instructors, who will deliver the professional development programs, and school directors and teachers, who will take part in the capacity-building activities. These participants are not considered beneficiaries as per MCC's definition.

FHI360 will implement Éxito Escolar in five departments: Alta Verapaz, Chiquimula, Jalapa, Sacatepéquez, and Sololá (Figure II.1).

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[6] In Spanish, Dirección General de Monitoreo y Verificación de la Calidad.

Figure II.1. Geographic scope of Éxito Escolar
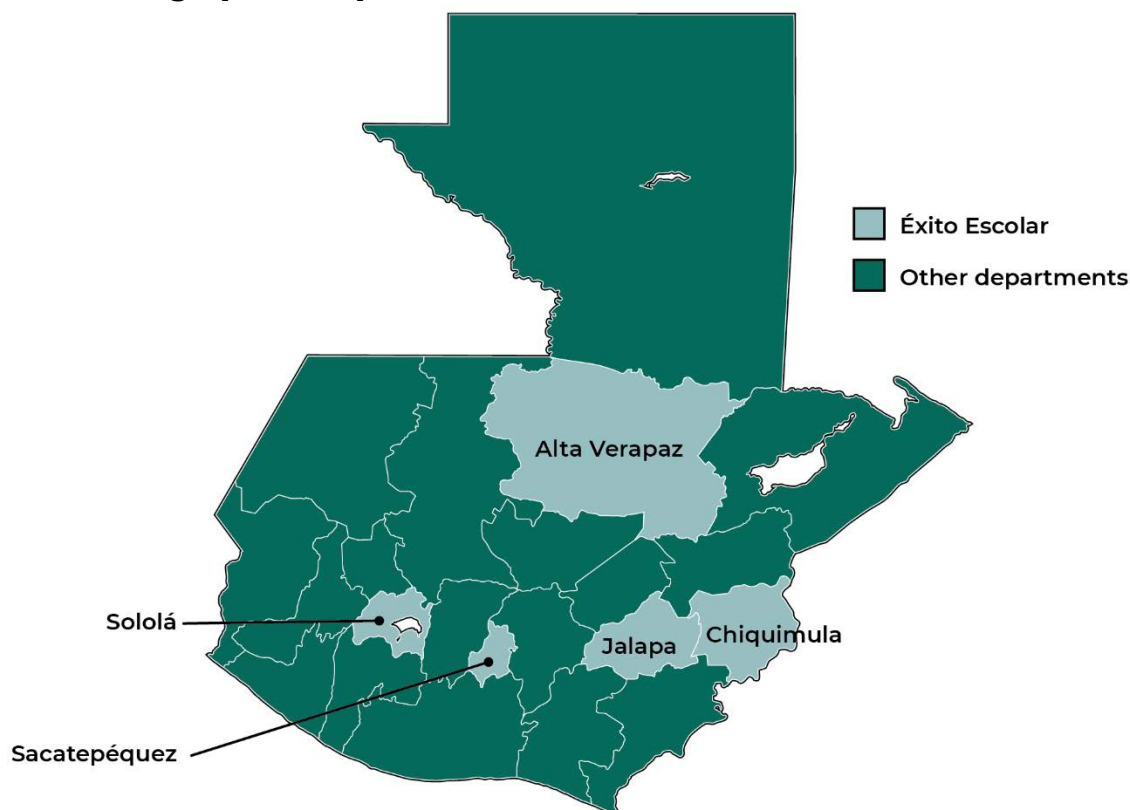
GEP's third activity is the Strengthening of Institutional Capacity and Planning (IPC) activity. Its objective is to strengthen the institutional capacity of MINEDUC to improve its planning and budgeting functions to enable it to provide an equitable and high quality secondary education (MCC 2016). The IPC activity will:

1. Assess the effectiveness and efficiency of different models of lower secondary schools with a sample of about 50 lower secondary schools.

2. Strengthen management information systems, support data collection, improve data quality, and promote the use of data as a tool for planning the delivery of secondary education services.

3. Advance the institutionalization of a competitive teacher selection process (including a diagnostic test).

4. Develop a geographic analysis of the supply and demand of secondary education as a factor in estimating needed resources for infrastructure, teacher assignments, and materials, and in planning and budgeting for a high quality education.

A. GEP theory of change

The theory of change developed by both MCC and MINEDUC staff encompasses a series of hypothesized causal links among program inputs and outputs and short-, medium-, and long-term outcomes that potentially support the program's overarching goal of improved preparation of youth for entry into the workforce (Figure II.2). Each of the links in the theory of change

represents an assumption by GEP program designers about how the activities will affect beneficiaries—students, teachers, school administrators, and parents and policymakers in relevant government of Guatemala ministries, departments, and offices.

The theory of change for Éxito Escolar assumes that the interventions will improve the quality of education in the short term (leading to improved student learning) and increase retention and promotion in the medium term (MCC 2016). The theory of change further assumes that improvements in students' outcomes should produce graduates who are better prepared for the workforce over the long term, thus linking the activity to the main project objective of improving the education of Guatemalan youth for success in the labor market.

The IPC activity's theory of change envisions institutional strengthening efforts that will integrate the various secondary education modalities and improve equity and results by developing and implementing policies, systems, and tools to recruit teachers and allocate material and financial resources effectively and equitably. A detailed description of the program, intended outcomes, literature, and initial findings are presented in Chapter IX.

Figure II.2. GEP theory of change
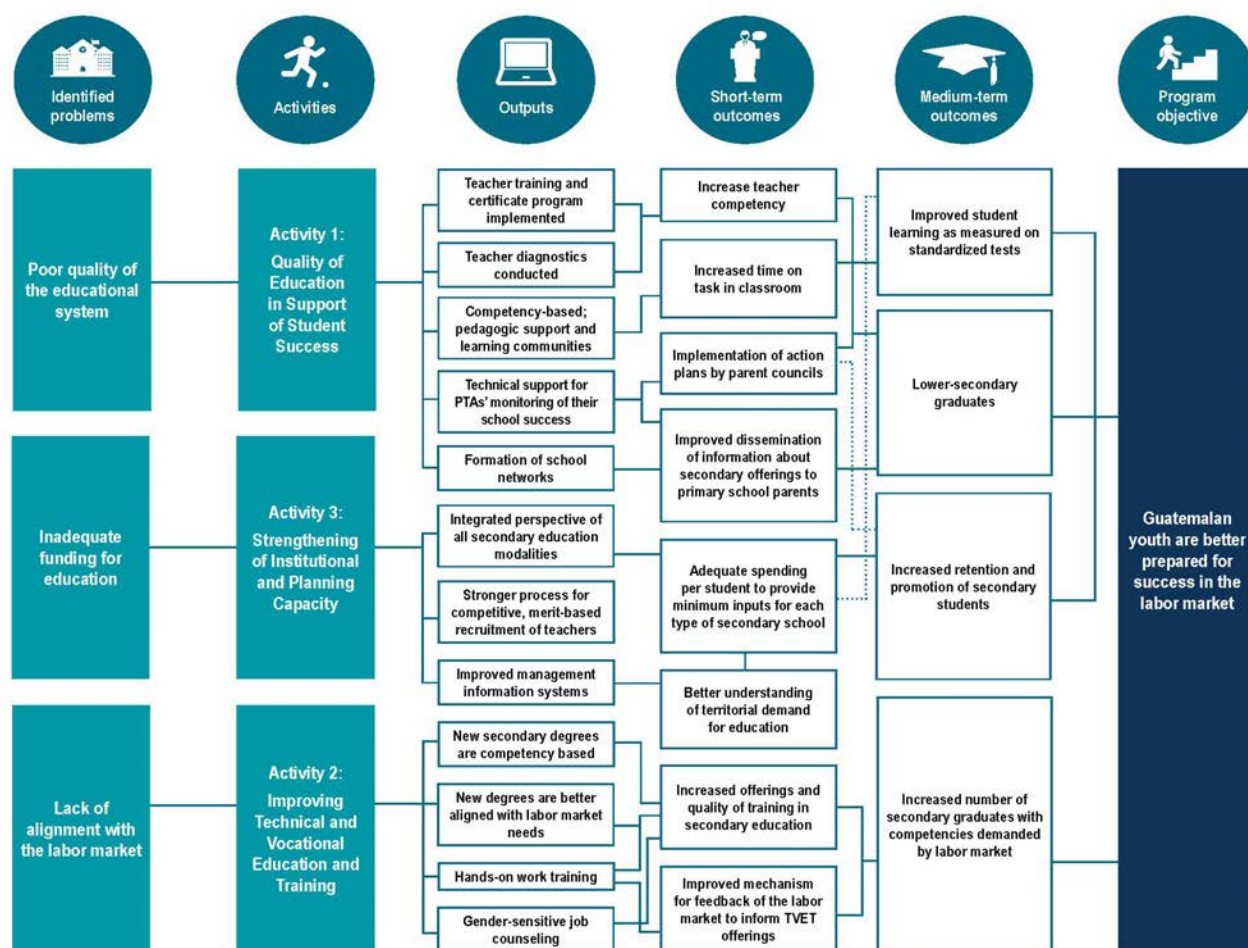
III. LITERATURE REVIEW FOR ÉXITO ESCOLAR

In this section, we summarize the literature related to professional development for teachers, pedagogic support and communities of practice, school networks, and parent organizations. Details of our original literature review can be found in both the GEP evaluability assessment and the evaluation design report (Felix et al. 2017). We then identify the contributions we expect the evaluation of Éxito Escolar to make to the literature.

A. In-service teacher training programs

The literature suggests that support to teachers is critical to the continual development of pedagogic skills. Rigorous evidence demonstrates a positive relationship between teachers' professional development and students' performance (Popova and Evans 2015; Conn 2014; Glewwe et al. 2011; Kremer et al. 2013; Krishnaratne et al. 2013; McEwan 2015; Murnane and Ganimian 2014; Muralidharan and Sundararaman 2010; Piper and Korda 2010). Findings from our review of the literature also suggest that dosage, duration, enabling environment, and type of intervention are key factors in program impacts.

Efforts to achieve improved student learning outcomes related to teacher-level interventions require sustained and intensive professional development and support (Darling-Hammond et al. 2009). Structured pedagogy programs, which typically address several constraints to learning—including poorly trained teachers—have demonstrated positive effects on students' learning outcomes. However, the programs have not affected school participation and retention, which are more responsive to student-level interventions (Snilstveit et al. 2016). Cohen and Hill (2001) suggest that teacher training can affect teachers' practices when the curriculum is designed to be consistent with the desired reforms. As such, continuous professional development that is aligned with curriculum materials and paired with strong pedagogic support is most likely to lead to sustainable change in teachers' behavior and methods. This is the approach that the GEP is currently implementing in Guatemala.

Although the international literature does not disentangle pedagogic support from teacher training programs, the evidence shows that programs with pedagogic support in the form of in-school teacher coaching or long-term teacher mentoring also had positive (although not always significant) effects on students' learning (Conn 2014; Brooker et al. 2013; Lucas et al. 2013; Sailors et al. 2010; Spratt et al. 2013; Rodríguez et al. 2010; Carr-Hill et al. 2015; Reimers and Cardenas 2007).

B. Time on task and learning

Studies in developing countries provide evidence that additional time spent on learning tasks can plausibly improve students' test scores. These studies include extensive analysis conducted by Bruns and Luque (2015) and Moore et al. (2012) across more than a dozen countries around the world.

C. Student learning assessments

There is a lack of rigorous evidence on the potential impacts of the role of student assessment in improving teaching and learning. Perry (2013) reviewed the evidence from formative assessments in Africa and found that it was promising but noticeably limited. Two

recent experimental evaluations in Liberia (Piper and Korda 2010) and South Africa (Piper 2009) show that formative assessments can generate large effects when paired with a detailed curriculum. A growing body of evidence on end-of-grade summative assessments suggests that assessment data can contribute to improved learning outcomes through the dissemination of assessment results. However, teachers need to be trained in how to use the results to support their students. The evidence also shows that summative evaluations can affect learning through an accountability effect. Piper and Korda (2010) found significant growth in test scores simply by reporting test data to families and schools. Andrabi et al. (2015) found that the dissemination of test scores to families in Pakistan through school report cards improved school quality and increased test scores by 0.1 standard deviations (SDs). Liuzzi et al. (forthcoming) also found positive impacts related to the use of student assessment and improved learning.

D. Parent organizations

A World Bank review of the literature (Bruns et al. 2011) on the impacts of school-based management (SBM) found that although there are many SBM programs around the globe, there are only a few well-documented rigorous impact evaluations. According to the literature, time is an important consideration, because SBM reforms tend to take at least two to three years to achieve their expected results. The first year is usually an adjustment period, when changes such as the creation of a parent council undergo initial implementation (Carr-Hill et al. 2015; Jimenez and Sawada 2003; Lopez-Calva and Espinosa 2006; King and Özler 2005; Bruns et al. 2011; Moore et al. 2012).

E. School networks

For several decades, Latin American countries have employed a variety of school network modalities for pedagogic and institutional management. Guatemala is experienced in implementing several school network modalities in primary schools. One of Guatemala's first experiences with school networks dates to the late 1940s when the country established school federations, which called for the organization of schools under a federation of grades, each with its own classroom and services. Since then, Guatemala has gained experience with networks of rural schools and regional schools, along with networks run by pedagogic advisors. Guatemala has also attempted to learn from the school networks experiences of Honduras and Peru (MINEDUC 2017). Our review of the literature on the impacts of school networks on enrollment, retention, transition, and learning shows that quantitative evidence on the success of this type of intervention is limited.

F. The impact evaluation's contribution to the literature

Our evaluation of Éxito Escolar will make several contributions to the existing literature. The impact evaluation will generate estimates of the impacts of professional development for teachers and school directors in combination with the formation of communities of practice. The implementation study of Éxito Escolar will help us understand the roles of parent organizations and school networks, as well as how the various sub-activities of Éxito Escolar may have contributed to changes in teaching practices, school management, and impacts on learning. Given the limited evidence on pedagogic support and school leadership, our findings could make an important contribution to further understanding of how best to train and support content knowledge development among secondary education teachers.

IV. Evaluation Design for Éxito Escolar

The overall goal of the evaluation is to generate learning that can inform decision making to improve the transition to and quality of secondary education in Guatemala. The evaluation uses a mixed-methods approach with two components: an impact evaluation and an implementation study. The impact evaluation uses a randomized-controlled trial design (RCT) to estimate the impact of Éxito Escolar relative to the prevailing practice on key teacher and youth outcomes in lower secondary school. The implementation study employs qualitative methods to provide context for the interpretation of results from the impact evaluation and to understand how and why Éxito Escolar achieved its results. In the remainder of this section, we describe how each of these components contributes to answering the research questions.

A.   Research questions

The evaluation addresses seven research questions. Table IV.1. lists the research questions and the design component that will answer each question.

Table IV.1. Research questions for the evaluation of Éxito Escolar

Research questions	Evaluation component
Was Éxito Escolar implemented as planned?	Implementation study
What were the main facilitators of and barriers to implementing Éxito Escolar?	Implementation study
Is there evidence of change in the hypothesized intermediate outcomes?	Implementation study/ impact evaluation
What are stakeholders' perceptions of the relative contributions of different sub-activities to observed changes in students' outcomes?	Implementation study
Did Éxito Escolar activities produce the intended impacts on key outcomes such as (a) teacher competencies, (b) instruction time, and (c) student outcomes?	Impact evaluation
Did impacts on students' outcomes vary as a function of students' gender, socioeconomic status, or language?	Impact evaluation/ implementation study
Do changes in teachers' competencies or time on task mediate changes in students' outcomes?	Impact evaluation/ implementation study

By answering these questions, the evaluation aims to offer actionable information to local and international stakeholders, including policymakers, practitioners, and funding agencies. More specifically, the implementation study will generate rich information about the conditions of lower secondary school teachers and students in the five departments where Éxito Escolar is being implemented and offer insights into how such conditions can facilitate or hinder the success of education reforms in Guatemala and similar contexts. The impact evaluation will estimate impacts of the educator-training program (PADEP/CB) and the pedagogical/management support offered as part of Éxito Escolar. Given the limited evidence on effective professional development and pedagogical support in low-income countries, findings from the evaluation could make an important contribution to knowledge about how best to train and support secondary school educators in Guatemala. The evaluation will also estimate the

impacts of Éxito Escolar on students' transition into secondary school. Together with the implementation study, these results will expand the international knowledge base on this topic by providing evidence on Éxito Escolar's potential role in improving education access and quality for Guatemalan students.

B. Impact evaluation design: RCT

The research design for the impact evaluation consists of randomly creating two experimental groups, one in which teachers and students would receive the intervention (the treatment or "T" group) and another in which they would not (the control or "C" group). Random assignment can create study groups that are expected to be similar to one another in observable and unobservable ways, allowing for the unbiased estimation of treatment effects. In this section, we describe our design and rationale.

Following consultations with DIGEDUCA and FHI360, we implemented a two-armed RCT to maximize the precision of our estimates of the overall impact of Éxito Escolar and allow flexibility in the implementation process. As noted, Éxito Escolar includes four sub-activities. Two of the sub-activities—teacher training and pedagogical support (including communities of practice)—were to be offered in all treatment schools. Two other sub-activities—school networks and support to parent organizations—are to be offered in only some treatment schools. Even though it would have been useful to form several treatment groups to estimate the separate impacts of each sub-activity, estimates with multiple treatment groups would necessarily have to be based on smaller groups and would have generated less precise findings. Furthermore, it was not feasible to assign schools randomly to school networks or parent organizations.

We used the education district as the unit of random assignment.[7] Districts were formed by MINEDUC based on geographical location and were intended to be lasting units of organization. Districts consist of an average of eight lower secondary schools. One hundred and three (103) districts including 805 lower secondary schools were available for randomization. Eligible schools had students enrolled in lower secondary grades, were not private or municipal, and belonged to one of five school modalities targeted by the program: National Basic Education Institutes (INEB), National Basic Education by Cooperative (Cooperatives), Educational Family Nuclei for Development (NUFED), National Basic Distance Education (Telesecundaria), and Experimental Basic Education Institutes with Occupational Orientation (PEMEM).[8]

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[7] Randomizing groups of schools rather than individual schools was preferable because Éxito Escolar involves the formation of communities of practice, which are groups of schools that will collaborate and share their experiences related to teacher training and pedagogic support. If schools were randomized, a control school could be surrounded by treatment schools in a community of practice that would exclude the lone control school. Such an arrangement would likely result in contamination or potentially lead to resentment or feelings of exclusion among control schools. In contrast, by randomizing districts, we could be assured that treatment and control schools are located near neighboring schools with the same treatment status, even though control districts are bordered by treatment districts. Although randomization by district rather than by individual school makes our estimates less precise, it ensures the integrity of the design and facilitates implementation for the Ministry of Education and FHI 360.

[8] We excluded municipal and private schools, as well as schools that had no students enrolled or were temporarily closed, as it was uncertain if they would be open at the time of program implementation.

We used a stratified random assignment to assign districts to treatment and control groups. We stratified districts by department and standardized reading and mathematics scores to ensure balance on those key characteristics and to improve the precision of our estimates of impacts on learning. (The details of the stratification and random assignment process are found in Appendix A.)

Program design documents indicate that parent organizations were to be formed in roughly 400 treatment schools and that 100 of the treatment schools were to be assigned to a school network with neighboring primary schools. MINEDUC was expected to select schools for parent organizations and school networks based on criteria that were being developed by its staff. Since implementation started, however, FHI360 encountered that most schools already had parent organizations. Therefore, the project will focus on supporting parent organizations to develop action plans, instead of establishing new organizations. Because only a subset of treatment schools are expected to participate in support activities for parent organizations[9], and a smaller subset are expected to form school networks, the treatment estimate will reflect the average impact of an offer of teacher training and pedagogic support, of a chance of an offer to participate in support activities for the parent council, and of a chance of an offer to join a school network. Figure IV.1 shows the random assignment design.

Figure IV.1. Random assignment design
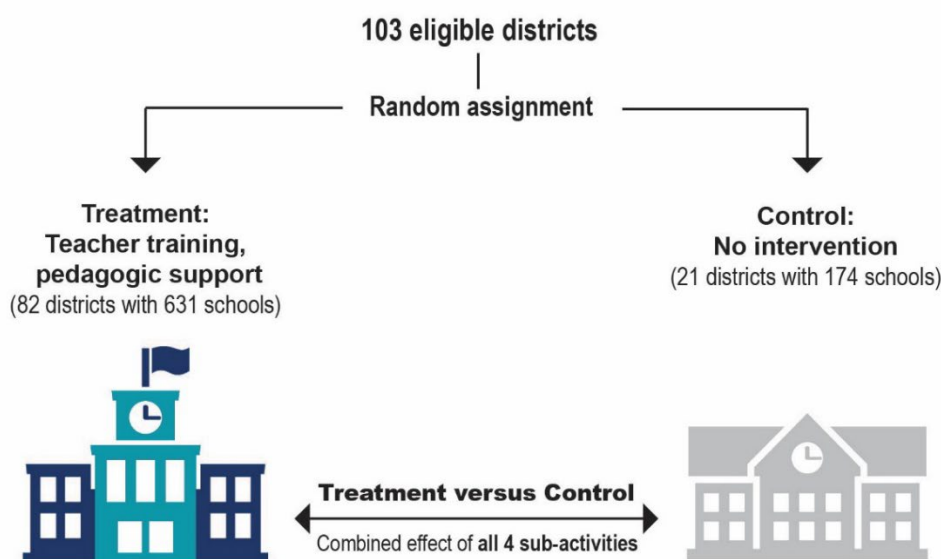
Note: All eligible schools in treatment districts will be invited to participate in teacher training and pedagogic support activities. Only some schools in treatment districts will be invited to join a school network or to form a parent council, but the participation criteria are yet to be determined. Treatment effect estimates will reflect the impact of the offer of teacher training and pedagogic support activities and the chance of the offer to join a school network or form a parent council.

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[9] All treatment schools with teachers participating in the PADEP/CB will receive support to develop the capacity of parent organizations. However, if there are treatment schools with no participating teachers, they will not participate in the activity.

1.   Statistical power

We updated the power analysis for the impact evaluation using baseline student assessments collected by DIGEDUCA/DIGEMOCA and classroom observations collected by Mathematica and our local data collection partner, Espirálica.[10] We focus on two sets of key outcomes: (1) students' test scores for mathematics, language and communication, and natural sciences, and (2) teachers' time on task for those three subjects. For each outcome, we report two minimum detectable effect sizes (MDES): intent-to-treat (ITT) analysis and estimates of the local average treatment effect (LATE). The MDES is the smallest effect size that we estimate we will be able to detect with the design. If the true effect of Éxito Escolar is smaller than the MDES, we do not expect to be able to detect that effect with our design and sample size.

For student academic outcomes, the results indicate that we should be able to detect impacts as small as 0.16 to 0.20 SDs with ITT analysis, which is not adjusted for contamination or noncompliance. For the LATE analysis, which in cases of noncompliance inflates the impact estimate to approximate the impact for participants, we should be able to detect impacts as small as 0.27 to 0.34 SDs (Table IV.2). We assume that all students at all study schools will be invited to take the endline test and that we will have endline data for 75 percent of students assessed at baseline.

Table IV.2. MDES for test score outcomes (effect sizes)

	ITT estimates	LATE
Mathematics	0.16	0.27
Language and communication	0.20	0.33
Natural sciences	0.20	0.34

Note: The MDES shown in the ITT column is the MDES for analysis that does not adjust for contamination. The MDEs shown in the LATE column is the MDES for analysis that does adjust for contamination, such as the LATE analysis. For this, we assume that the schools of 70 percent of students in treatment schools receive their intended treatment, whereas the schools of 10 percent of students in control schools access treatment. To calculate the MDEs, we assume 80 percent power, a two-tailed test, and a 5 percent significance level. We assume that we will have test score data for 75 percent of students in sample schools. We estimate that the covariates we plan to include in the end line impact regression model (for example students' baseline scores and gender) will explain 30 percent of the individual-level variance in the outcome variable. We also assume that we will explain 75 percent of the group-level variance in the outcome variable. We consider this a conservative estimate because, at baseline, a small portion of the variance in student outcomes (20 to 32 percent) lies between districts and most of the variance can be explained by adding strata indicators. The results are based on data from 7th grade students only.

For teacher time on task, the results indicate that we should be able to detect impacts as small as 0.35 and as large as 0.46 SDs with the ITT analysis (Table IV.3), equivalent to a change of approximately 7 to 9 percentage points on teachers' time on task, respectively. We estimate that for the LATE analysis we would be able to detect impacts from 0.58 to 0.76 SDs (Table IV.3).

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[10] Original power calculations can be found in the Evaluation Design Report (Moore et al. 2018.).

Table IV.3. MDES for teacher time on task (effect sizes)

	ITT estimates	LATE
Percentage of mathematics class time spent on instruction	0.37	0.62
Percentage of communication class time spent on instruction	0.35	0.58
Percentage of natural sciences class time spent on instruction	0.46	0.76

Note: The MDES shown in the ITT column is the MDES for analysis that does not adjust for contamination. The MDE shown in the LATE column is the MDES for analysis that does adjust for contamination, such as the LATE analysis. For this, we me that 70 percent of treatment schools receive their intended treatment, whereas 10 percent of schools in control schools access treatment. To calculate the MDES, we assume 80 percent power, a two-tailed test, and a 5 percent significance level. We use baseline data from 7th grade teachers to estimate the standard deviations and intra-class correlations (ICCs) for the outcomes. Standard deviations are 18.5 for mathematics, 17.5 for communication, and 19.5 for natural sciences. ICCs are the percentage of variance that is between districts and are 12 percent for mathematics, 5 percent for communication, and 7 percent for reading. We assume that we will be able to explain at least 10 percent of the variance within districts, by including end line covariates such as teachers' gender and level of education (which were not available at baseline). We also assume that we will explain at least 50 percent of the variance between districts. All regression models include sampling weights to correct for the under-representation of teachers in large schools. We assume that we will have classroom observation data for at least 75 percent of sample schools for all subjects.

There are several differences between the MDES reported in Table IV.3 and the minimum detectable effects reported in the Evaluation Design Report (EDR). One notable difference is that the ICCs (or ratio of between-group variance to total variance) in our baseline data are much smaller than estimated in the EDR. The reason is that we are estimating variation between districts (the unit of randomization for this evaluation) instead of variation between schools, the typical grouping variable reported in the literature. Specifically, the EDR calculations assumed an ICC of 40 percent for the time-on-task outcomes, while ICCs estimated with baseline data for this evaluation ranged from 5 to 12 percent only. Another main difference is that fewer than expected natural sciences lessons were observed, resulting in a reduction in the number of districts from 103 to 95. Because power is largely driven by the number of districts in our sample, this reduction has a large impact on MDES estimates. At endline, we will ensure that natural sciences lessons are observed in all study districts. In addition, our endline models will include individual-level covariates that will explain some of the between-teacher variation within districts, with an expected increase in power.

C.   Impact evaluation sampling procedures and response rates

In this section, we describe the sampling procedures and response rates for baseline data collection. Data collection for the implementation study took place in February/March 2019.

The sampling frame for the evaluation was a publicly available data set from MINEDUC that included 805 lower secondary schools in the five study departments.[11] We excluded private and municipal schools, as well as schools that were closed or had no students enrolled in lower secondary grades.

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[11] The sampling frame was based on a 2013 school-level dataset downloaded from MINEDUC's public website (http://estadistica.mineduc.gob.gt/). Schools' district information was updated using data from DIGEMOCA.

The study sample includes all schools in the control group (174 schools in 21 districts) and one-quarter of the schools assigned to the treatment group. We used a systematic sampling approach to draw the sample of treatment schools. We sorted treatment districts in random order, sorted each treatment district's schools in random order within the district, and selected every fourth school for the sample. This approach ensured that the sample was evenly distributed across the 82 districts. A sample of 158 treatment schools from the 82 districts was selected, resulting in 332 schools in the study. The number of study schools by treatment and control differs because, due to random chance, the districts assigned to the control group were slightly larger on average than the districts in the treatment group. Table IV.4 shows the number of eligible schools in the study (our sampling frame) and the number of schools selected for data collection by department.

Table IV.4. School sampling frame and sampled schools, by treatment group and department

	All eligible schools			Sampled schools		
	Treatment	Control	All	Treatment	Control	All
Alta Verapaz	243	62	305	61	62	123
Chiquimula	119	38	157	29	38	67
Jalapa	96	24	120	25	24	49
Sacatepéquez	54	15	69	15	15	30
Sololá	119	35	154	28	35	63
All departments	**631**	**174**	**805**	**158**	**174**	**332**

We generated a list of 160 potential replacement schools by selecting the school right before or right after the selected school from within the same district in the ordered list from which we selected treatment schools for the study sample. In cases where more than one replacement was available per district, data collectors chose the school with the smallest random number. Six schools were replaced (one school from the control group[12] and five from the treatment group) because they were located in an unsafe area, the school was closed, or all teachers had been temporarily assigned to a different school.

School directors. All school directors in the study sample were invited to take part in the study. If the director was not available, the assistant director answered questions about the school and the director was contacted to answer personal questions over the phone, at his or her convenience. The field team was unable to establish contact with one school, resulting in a response rate of 99.7 percent.

Teachers. We aimed to collect data from up to three teachers per school, or one 7th-grade teacher for each of the three subjects of interest: mathematics, language and communication, and

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[12] Because all control schools were included in the evaluation sample and there were no additional control schools that could serve as replacements, the field team replaced one control school that is no longer functioning with a treatment school.

natural sciences.[13] This approach was not always possible because some schools had fewer than three eligible teachers. In such cases and in cases when there were just three eligible teachers in the school, all eligible teachers were invited to participate in the study. In schools with more than three eligible teachers, we used a random numbers table to draw the sample. We randomized the order of the three subjects to avoid order-effect biases. Replacement teachers were drawn in cases where a sampled teacher was going to be absent in the long term (for example, due to illness) or was absent both on the day of data collection and when the data collection team tried to collect the data on a different date. Table IV.5 shows the number of completed baseline teacher questionnaires and classroom observations. The table also shows the percent of completed teacher questionnaires and classroom observations by treatment group and subject. Response rates vary from 84 to 100 percent and there are no notable differences in the percent of teachers who completed a questionnaire and were observed in the classroom across treatment and control schools. Among the teachers who completed a teacher questionnaire, the highest response rate is for mathematics teachers, 97 percent in treatment and 94 percent in control schools. The response rates for natural sciences and language and communication teachers is slightly lower, but similar across treatment and control groups, 85-86 and 87 percent, respectively. Among the teachers who were observed in the classroom, the highest response rate is for language and communication teachers in treatment schools – 100 percent, compared to 98 percent in control schools. The response rate for mathematics teachers is similar across treatment and control groups, 95 and 94 percent, respectively. The response rates for natural sciences teachers is slightly lower, but also very similar across treatment and control groups, 85 and 84 percent, respectively.

Table IV.5. Completed baseline teacher questionnaires and classroom observations, by subject and treatment group

	Number completed in all schools	Number completed in treatment schools	Percent completed for treatment schools	Number completed in control schools	Percent completed for control schools
Teacher questionnaires					
Mathematics	317	154	97%	163	94%
Natural sciences	286	134	85%	152	87%
Language and communication	287	136	86%	151	87%
Classroom observations					
Mathematics	314	150	95%	164	94%
Natural sciences	281	135	85%	146	84%
Language and communication	329	158	100%	171	98%

Note: Some teachers were interviewed and observed for more than one subject. Therefore, the number of teachers interviewed and classrooms observed is smaller than the number of questionnaires and

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[13] In some schools, other subjects were taught instead of the three subjects of interest. We surveyed teachers from these other subjects when no other teacher was available. Those subjects were biology (n=30), physics and chemistry (n=3), "Spanish" and language and communication in students' first or second language, which may differ from Spanish (n=66). For all analysis purposes, these subjects were mapped to the 3 subjects of interest, such that biology and physics and chemistry equal natural sciences, and Spanish and language and communication in students' first or second language equal communication.

observations completed by subject. This table shows the number of questionnaires and classroom observations completed. The percentages use 1 teacher per subject in the denominator.

Students. All 7th-grade students who were present on the day of the assessments were administered two of three assessments to reduce participant burden. The number of students tested per subject is shown in Table IV.6.[14] Using school director reports on the number of students enrolled, we find large discrepancies between the numbers of students who were administered the tests and the number enrolled in 7th grade. On average, 85 percent of enrolled students across both groups were administered the assessments, which means that 15 percent of enrolled students were not assessed. The percentage of students who were administered the assessments does not differ as a function of treatment status (86 percent in T and 84 percent in C, $p = 0.26$; not shown in Table), which indicates that non-response is unlikely to bias our conclusions about baseline differences between the groups. At endline, it will be important to collect accurate data on the number of students enrolled as well as reasons for non-response to assess whether non-response may bias our impact estimates or limit the generalizability of our results.

Table IV.6. Completed student assessments, by subject and treatment group

	Number completed in all schools	Number completed in treatment schools	Number completed in control schools
Mathematics	7,760	4,049	3,711
Natural sciences	7,913	4,109	3,804
Language and communication	7,823	4,076	3,747

D. Implementation study design

The implementation study will draw on two rounds of qualitative data collected through interviews with key stakeholders and through focus groups with project beneficiaries, including school directors, teachers, students, parents, and community members. The first round of qualitative data collection (March 2019) gathered information about facilitators of and barriers to successful implementation, along with perceptions and attitudes related to the implemented activities. The first round of data collection took place approximately six months after the treatment intervention related to teacher professional development began in the schools.[15] The second round will take place in October/November 2020 and will allow us to assess whether the school directors or teachers demonstrate behavior changes after the conclusion of the teacher-training program (the group of school directors and teachers participating in focus groups will likely vary from year to year). In addition, the implementation study will benefit from survey data (collected in 2018 and 2020) and test score data (collected in 2018, 2019, and 2020).

The implementation study will complement the impact evaluation in several ways. First, it will enhance the RCT by enabling us to explore how, why, where, and for whom the estimated changes in outcomes did or did not occur (related to research questions 4, 5, and 7). Second, the study's qualitative data may shed light on stakeholders' perceptions of the individual

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[14] The assessments were administered to 8th-grade students as well, but those data are outside of the scope of this report.

[15] The PADEP/CB started in August 18, 2018.

contributions of intervention sub-activities. This is important because the RCT will allow us to estimate only the combined impact of all Éxito Escolar sub-activities. Third, the implementation study will complement the quantitative data gathered from classroom observations by enabling us to understand the findings related to teachers' behavior changes and capacity building. Finally, the implementation study will enable us to answer the research questions related to the sustainability of the project and its potential for scale-up (research questions 1–3).

E. Implementation study sampling procedure

Mathematica worked with Espiralica, our data collection partner, to conduct data collection in March of 2019. Espiralica visited 15 treatment schools across the five departments included in the evaluation (Table IV.7). We randomly selected the schools out of the sample of 158 treatment schools, but selection was constrained as to select (1) at least 1 school in each department (2) at least 1 school from each school modality, and (3) schools with varying levels of academic performance. Schools were categorized as low, medium, or high performers using student scores in mathematics, language and communication, and natural sciences from Pruebas Avanzo. We sampled six low performing schools, 5 high performing schools, and 4 medium performing schools. Our sampling approach ensured that sampled schools reflected a variety of schools along key dimensions of interest. All 15 schools participated in the qualitative data collection activities.

Table IV.7. Main sample of schools for the implementation study

	Cooperativa	INEB	NUFED	PEMEM	Telesecundaria
Alta Verapaz	1	2	1	1	1
Chiquimula	0	1	1	0	1
Jalapa	0	0	1	1	0
Sacatepéquez	0	0	1	0	0
Sololá	1	0	1	0	1
Total	**2**	**3**	**5**	**2**	**3**

We purposely selected 21 additional schools based on their geographical proximity (up to 15 km) to the 15 schools in the main sample. Additional schools had fewer than 3 teachers and it would have been impractical to conduct the data collection activities in those schools. Instead, teachers from those schools were invited to participate in the focus groups held in one of the 15 schools in the main sample. Most of the additional schools were telesecundaria (n=18) and the remaining were NUFED (n=3). Schools were located in Alta Verapaz (n=10), Chiquimula (n=9), Sololá (n=1) and Jalapa (n=1). Teachers from 14 out of the 21 additional schools participated in the focus groups.

At each school, we conducted one in-person interview with the school director and focus group discussions with teachers in grades 1-3, parents of students in grades 1-3, and grade 1 students. The number of participants ranged from 1 to 9 in the teacher focus groups[16], from 6 to

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[16] Two focus groups had only one participating teacher.

11 in the student focus groups, and from 5 to 16[17] in the parent focus groups. In schools with more than 8 eligible students, student focus groups were done separately by gender. Two translators specialized in the Mayan languages Qeqchi, Poqomchi, and K'iche' assisted moderators in conducting the focus groups with parents and students who felt more comfortable using the local languages spoken in Alta Verapaz and Sololá.[18] The protocols were translated into the local languages to facilitate administration of the focus groups. The translators supported 7 out of 15 focus groups with parents and 4 out of 24 focus groups with students.

In addition to school visits, our team interviewed six PADEP/CB instructors and personnel from FHI 360 and the Ministry of Education. The total number of interviews and focus groups is shown in Table IV.8.

Table IV.8. Implementation data

Data source type	Number of interviews or focus groups
Director interview	15
Teacher focus groups	15
Student focus groups	24
Parent focus groups	15
PADEP instructor interviews	6
Interviews with other stakeholders	5
Total	**80**

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[17] Only one focus group had 16 participants. The maximum number of participants for the other groups was 12.

[18] The Mayan Language Academy of Guatemala verified the translators' credentials and qualifications and they participated in the field staff training and practice.

V. DATA SOURCES AND OUTCOME DEFINITIONS

A. Impact evaluation key outcomes

The evaluation draws on both primary and secondary data sources, including school director questionnaires, teacher questionnaires, and classroom observations gathered by Mathematica and Espirálica; student assessments collected by DIGEDUCA/DIGEMOCA; and administrative data collected by MINEDUC's Department of Planning (DIPLAN).

The impact evaluation focuses on a select number of teacher and student outcomes, based on their importance to the program logic. Short-term outcomes relate to the pedagogic approaches teachers use in the classroom and time on task, as measured through classroom observations. Medium-term outcomes include enrollment, promotion, repetition, and dropout rates as measured through changes in administrative data, and student learning as measured by standardized tests. We describe each of these outcomes in more detail in Table V.1.

Table V.1. Impact evaluation key outcomes, data sources, and data collection timing and grades

Short-term outcomes	Description	Data sources	Data collection rounds	Grades for data collection
Teacher pedagogic approaches	Percentage of lesson time that teachers spend using pedagogical practices such as reading aloud, lecturing, engaging in discussion, and assigning individual class work or practice and memorization activities.	Classroom observations collected by Espiralica	2018, 2020	7th grade in 2018 9th grade in 2020
Time on task in the classroom	Percentage of lesson time that teachers spend on instruction, classroom management, or off task. Percentage of lesson time that students are engaged in academic activities, management activities, or off task.	Classroom observations collected by Espiralica	2018, 2020	7th grade in 2018 9th grade in 2020
Medium-term outcomes	**Description**	**Data sources**		
Student enrollment rate	Number of students enrolled each year, excluding students who are repeating grades.	Administrative data collected by MINEDUC/ DIPLAN	Yearly from 2016 - 2020	6th - 9th grades
Student promotion/transition rate	Percentage of students who are promoted to the next grade at the end of the academic year.	Administrative data collected by MINEDUC/ DIPLAN	Yearly from 2016 - 2020	6th - 9th grades
Student repetition rate	Percentage of students who are held back in the same grade at the end of the academic year	Administrative data collected by MINEDUC/ DIPLAN	Yearly from 2016 - 2020	6th - 9th grades
Student dropout rates	Percentage of students who drop out during the school year (students who no longer attend school at the end of the school year divided by the total number of students enrolled in school at the beginning of the school year).	Administrative data collected by MINEDUC/ DIPLAN	Yearly from 2016 - 2020	6th - 9th grades

Short-term outcomes	Description	Data sources	Data collection rounds	Grades for data collection
Student academic performance	Each student was tested on two out of three subjects: mathematics, language and communication, and natural sciences. The assessments for each subject included 49–50 items. Items had difficulty levels appropriate for children in 3rd grade of primary school to 7th grade (the first grade of lower secondary school). MINEDUC computed individual ability[19] and percentage of correct scores for each student. The assessments were revised for endline data collection to measure skills relevant to the grades examined.	Standardized tests administered by MINEDUC/ DIGEDUCA/ DIGEMOCA	2018, 2019, 2020	2018: 7th grade[B] 2020: 9th grade[B]

[B] The table shows the grade levels from which data are required for the impact evaluation. MINEDUC may collect data from additional grades.

B. Implementation study key outcomes

In the first round of qualitative data collection for the implementation study, we seek to understand key barriers and facilitators for the implementation of Éxito Escolar, as well as to document the status of program activities to date. We conducted focus groups and individual interviews to explore stakeholders' beliefs and attitudes that may influence program take-up, implementation quality, and the program's ability to have a positive effect on student outcomes—the ultimate goal of Éxito Escolar. We complement the qualitative data with FHI 360's monitoring and evaluation (M&E) data to assess initial rates of program take-up by teachers and school directors, the number of pedagogical support visits, and the number of parent organizations supported[20]. Table V.2 provides a brief description of key outcomes and data sources for the implementation study. The data collection protocols are found in Appendix B.

Table V.2. Implementation study key outcomes and data sources

Barriers and facilitators to implementation	Description	Data sources	Data collection rounds
Program designer and implementers' perceptions of barriers and facilitators to program implementation and adoption	Perceptions about: • How well the program was planned • Success or failure in engaging stakeholders (e.g., educators and caregivers) and executing planned activities • Institutional and community support • Beneficiaries' openness and readiness to change	Interviews with FHI 360 staff, pedagogical advisors, and university professors delivering the professional development component	2019[A], 2020

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[19] Ability scores are based on a Rasch model (Dirección General de Evaluación e Investigación Educativa (DIGEDUCA). "Plan de Análisis Pruebas Avanzo: Versión preliminar." Ministerio de Educación. Ciudad de Guatemala, Guatemala, 2018).

[20] Original program design documents indicated that the project would establish parent organizations/organizations in a subset of schools. However, because parent organizations/organizations already exist in most schools, the program will focus on supporting existing organizations/organizations.

Barriers and facilitators to implementation	Description	Data sources	Data collection rounds
Educator openness/receptivity to program take up	Perceptions about the characteristics of the program, including its quality, potential to effect change, advantage relative to alternatives or current practices, simplicity, etc.	Focus groups with teachers and educators	2019[A], 2020
Educator and MINEDUC perceptions of barriers and facilitators to take up	Perceptions/attitudes regarding institutional and community support as well as educators' individual characteristics	Focus groups with teachers and educators	2019[A], 2020
Caregivers' beliefs and attitudes	Parents' beliefs and attitudes about the importance of education Perceptions of barriers and facilitators for students to stay in the education system	Focus groups with students' caregivers	2019[A], 2020
Students' beliefs and attitudes	Students' beliefs and attitudes about the importance of education Perceptions of barriers and facilitators for them to stay in the education system	Focus groups with students	2019[A], 2020
Implementation outcomes	**Description**	**Data sources**	
Teacher enrollment rates in professional development program (PADEP/CB)	Percentage of treatment schools with at least one teacher enrolled in the professional development program	FHI 360 M&E data	2019, 2020
School director enrollment in professional development program (PADEP/CB)	Percentage of treatment schools where the school director is enrolled in the professional development program	FHI 360 M&E data	2019, 2020
Parent organizations established	Total number of parent organizations established relative to number planned (400)	FHI 360 M&E data	2019, 2020
Pedagogical support visits conducted	Number of pedagogical support visits received per month per school, relative to the number planned (TBD)	FHI 360 M&E data	2019, 2020
Teacher knowledge	Pending	FHI 360 data, collected with support from DIGEDUCA and DIGEMOCA	

[A] Data collection took place from March 4 to 15, 2019.

VI. IMPACT EVALUATION BASELINE FINDINGS FOR ÉXITO ESCOLAR

This chapter presents our findings related to the equivalence of our treatment and control groups. The results include tests of differences between the treatment and control groups at each of the four levels of data collected: school, director, teacher, and student. We find that the groups are balanced on most key characteristics tested, including school size, school infrastructure, and school director, teacher, and student characteristics, but find differences between the groups on school modality and student promotion rates. Section A shows the baseline equivalence results for the key school, director, teacher, and student characteristics. Section B presents the results for implementation outputs such as school director and teacher professional development. In Section C, we discuss equivalence on teacher pedagogical practices and time on task. Section D presents results for student learning outcomes. A description of the quality assurance procedures that we followed to verify the data is found in Appendix C.

A. Baseline equivalence on key school, director, teacher, and student characteristics

Baseline equivalence on school size and modalities

The treatment (T) and control (C) groups are balanced with respect to the total number of students and teachers as well as the number of one-teacher (*unidocente*) schools in each group. Table VI.1 presents basic school characteristics by treatment group. The typical school in the sample has over 100 students, of which roughly 40 percent are female. The average school in the treatment group has six teachers, whereas the average school in the control group has five teachers. This difference does not reach the 5 percent level if statistical significant, but does reach the 10 percent level—meaning that there is a 10 percent chance that the result occurred by chance. Henceforth, we refer to these differences as "marginally significant." Only 13 percent of schools in both groups have only one teacher.

The percentage of female students in lower secondary grades as a whole is equivalent between the groups. However, the percentage of girls in grade 7 is 3 percentage points larger in the control group than in the treatment group (43 percent and 40 percent, respectively). This difference is only marginally significant at the 10 percent level. There are no significant differences in the percentages of female students in other grades.

Although the groups are largely equivalent in student and teacher characteristics, there are noteworthy differences between the T and C groups in terms of school modalities. Table VI.1 shows that in two cases there are 10 to 11 percentage point differences between T and C groups. Specifically, 21 percent of schools in the T group belong to the INEB (National Institute of Basic Education[21]) modality, whereas only 11 percent of schools in the C group are INEB. Forty-three percent of schools in the T group are telesecundaria compared to 54 percent in the C group.[22] **These differences are statistically significant and relatively large**, which could

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[21] Instituto Nacional de Educación Básica, in Spanish.

[22] INEB schools offer traditional instruction, with teachers who specialize by subject. Telesecundaria schools typically have a single teacher for section or grade, are located in remote rural areas, and are expected to rely on audiovisual and written aids to a greater extent than INEB schools.

make it difficult to attribute endline differences to the intervention, because any observed differences could be attributable to preexisting differences in the composition of the two groups. Telesecundarias were developed to serve rural and harder-to-reach populations and often rely on a single teacher per grade or section. INEB schools are generally urban and have multiple teachers who specialize by subject. We note that there is a large difference between enrollment in the treatment and control schools (21 percentage points). Although the difference is not statistically significant, it may reflect the different structure and size of the modalities assigned to each group. The imbalance in modalities was generated by chance during the random assignment process but could lead to variation in learning outcomes and could be confounded with variation due to intervention status. Our impact estimation models will include modalities as covariates to control for this difference observed between groups.

Table VI.1. Basic school characteristics by treatment group

	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Student characteristics				
Total number of students enrolled in lower secondary grades (Ciclo básico, in Spanish)	120.4	99.3	21.1	0.18
Percentage of female students in lower secondary grades	41.6	42.2	-0.6	0.56
Percentage of female students by grade				
Seventh grade	40.1	43.0	-2.9*	0.06
Eight grade	42.7	41.2	1.5	0.35
Ninth grade	40.4	41.6	-1.2	0.49
Teacher characteristics				
Total number of teachers at the school	6.0	4.9	1.1*	0.07
Unidocente (only one teacher in the school)	13.1	12.9	0.2	0.97
School Modality				
INEB	20.8	10.5	10.3***	0.01
Telesecundaria	43.4	54.0	-10.6**	0.04
NUFED	15.3	15.5	-0.2	0.97
Cooperativa	17.9	20.1	-2.2	0.57
PEMEM	2.7	-0.1	2.8	0.13
Total number of schools	**158**	**173**		

Source: Baseline School Director Survey 2018

Notes: Columns A and B present regression-adjusted group means from regressions that include binary indicators to account for the strata used in the random assignment design. Regression-adjusted means can sometimes take values below zero (such as the control for the PEMEM school modality). Such values are meaningless in practice and should be interpreted as zero. Multilevel linear models were used to account for the clustering of schools in school districts.

*Difference in group means is marginally significant at the .10 level.

**Difference in group means is statistically significant at the .05 level.

***Difference in group means is statistically significant at the .01 level.

Baseline equivalence in school infrastructure

Research shows that school infrastructure affects student attendance, retention, and the quality of education imparted to students (UNICEF 2009). This section examines baseline equivalence between the study groups in terms of schools' construction materials, classroom conditions (desks, lighting, and so on), and water, sanitation, and hygiene (WASH).

The schools are equivalent in terms of the materials used for walls, floors, and ceilings.
Less than 10 percent of schools in both groups have floors and walls made of unfinished
materials. However, a large percentage in both groups reported that the school infrastructure
does not function or needs maintenance. Notably, over 40 percent in both groups reported that
the ceiling is in poor condition and over half reported that exterior walls are not functional or
need maintenance. More than half of the schools in both groups lack desks and chairs that are in
good condition for all students; nearly a quarter of the school directors reported problems with
interior noise, and about a third of school directors reported the presence of smoke, dust, or
contaminants inside the classroom, which can lead to increased health problems and difficulty
learning among students (see Table VI.2).

**The T schools in our sample are in slightly better condition overall. We find marginally
significant differences between the T and C groups relative to lighting, classroom
ventilation and temperature, and exterior noise.** Compared to 41 percent of schools in the
treatment group, 51 percent in the control group reported insufficient lighting (see Table VI.2).
Also, 54 percent of treatment schools reported problems related to ventilation and temperature,
compared to 63 percent of control schools, and 26 percent of treatment schools reported
problems with exterior noise, compared to 36 percent of control schools. Differences range from
9 to 10 percentage points but are only marginally significant at the 10 percent level. Our endline
impact models will adjust for these differences, unless they can be accounted for by differences
in modalities.

Table VI.2. School infrastructure by treatment group

	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Infrastructure made of unfinished materials (percentage)				
Floors made of soil or unfinished wood	3.6	7.7	-4.1	0.11
Walls made of unfinished materials (unfinished wood, adobe, bajareque, lepa)	2.7	5.1	-2.4	0.25
School infrastructure in poor condition (does not function or needs maintenance) (percentage)				
Ceiling	43.9	46.8	-2.9	0.59
Floor	37.2	45.2	-8.0	0.13
Interior walls	26.2	33.9	-7.7	0.13
Exterior walls	52.2	50.6	1.6	0.76
Classroom conditions that affect teaching (percentage)				
Lack of desks and chairs in good condition for all students	61.3	66.0	-4.7	0.36
Insufficient lighting	41.0	51.0	-10.0*	0.06
Problems related to ventilation and temperature (too hot or too cold)	53.7	62.5	-8.8*	0.08
Exterior noise	25.9	35.9	-10.0*	0.05
Interior noise	22.0	26.1	-4.1	0.38
Presence of smoke, dust, or contaminants	32.1	35.4	-3.3	0.52
Total number of schools	**158**	**173**		

Source: Baseline School Director Survey 2018

Notes: Columns A and B present regression-adjusted group means from regressions that include binary indicators
to account for the strata used in the random assignment design. Multilevel linear models were used to
account for the clustering of schools in school districts. Bajareque refers to sticks of diverse origin bound
with mud or planted in the ground. Lepa is the bark of the tree discarded after wood is treated.

*Difference in group means is marginally significant at the .10 level.

We also find that although the T schools tended to fare better in terms of classroom conditions, slightly more control schools had separate toilets for boys and girls compared to treatment schools (84 percent compared to 79 percent, respectively) (Table VI.3). However, the difference is not statistically significant, and slightly more treatment schools report the availability of sinks, potable water, and indoor plumbing (only the last is marginally significant, at the 10 percent level). Examining balance in WASH is important because it affects student attendance, especially for girls in lower and upper secondary school (UNICEF 2009). We will adjust for the imbalance in indoor plumbing in our impact estimation models.

Table VI.3. School characteristics related to hygiene, by treatment group

	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Type of toilets for student use (percentage)				
Connected to septic tank or drainage network	52.8	49.4	3.4	0.50
Latrines or wells	47.2	50.6	-3.4	0.50
Separate toilets for boys and girls (percentage)	78.7	84.2	-5.5	0.18
Sinks for handwashing near the toilets (percentage)	63.3	56.6	6.7	0.17
Potable water (percentage)	39.5	31.5	8.0	0.11
Indoor plumbing (percentage)	50.1	40.9	9.2*	0.06
Total number of schools	**158**	**173**		

Source: Baseline School Director Survey 2018

Notes: Columns A and B present regression-adjusted group means from regressions that include binary indicators to account for the strata used in the random assignment design. Multilevel linear models were used to account for the clustering of schools in school districts.

*Difference in group means is marginally significant at the .10 level.

Baseline equivalence in school director and teacher characteristics

School directors play an important role in the management and effective functioning of schools. They are responsible for managing school resources, observing teachers, talking to parents, and representing the school in the community (Bruns et al. 2015). The quality of school directors can vary widely in terms of their levels of education, experience, and age so it is important to measure equivalence between T and C schools. **There are no statistically significant differences between the characteristics of school directors by intervention group** (Table VI.4). Most school directors in both groups are male (74 percent of treatment and 69 percent of control school directors, respectively). School directors average seven to eight years of experience and many have completed a *profesorado.* Most (roughly 75 percent) speak Spanish as their mother tongue, though half are bilingual, having learned to speak both Spanish and a local language at home.

Table VI.4. School director characteristics at baseline, by treatment group

	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Female (percentage)	25.6	30.9	-5.3	0.27
Speaks Spanish as mother tongue (percentage)	76.6	74.5	2.1	0.59
Speaks a local language as mother tongue, not exclusive of Spanish (percentage)	50.7	49	1.7	0.61
Has a "profesorado" teaching degree (percentage)	40	34.5	5.5	0.29
Highest level of education is a "profesorado" or higher (percentage)	84.7	87.4	-2.7	0.5
Years as director at current school	7.4	7.7	-0.3	0.64
Director is also a teacher at the school (percentage)	74.1	73.3	0.80	0.86
Total number of schools	**158**	**173**		

Source: Baseline School Director Survey 2018

Notes: Columns A and B present ordinary least squares regression-adjusted group means from regressions that include binary indicators to account for the strata used in the random assignment design. Multilevel linear models were used to account for the clustering of schools in school districts. The percentages for Spanish speaker and speaker of a local language do not add up to 100 because they are not mutually exclusive. Directors were asked about the languages they learned to speak at home and some selected more than one language. Levels of education higher than profesorado include Bachelor's degree in education or other field and postgraduate degrees.

To assess the number, gender, and type of teacher the schools hire, we asked school directors a series of survey questions related to teachers in their schools. **Our analysis shows that teachers in the T and C groups are largely equivalent.** Forty-one percent of teachers in both groups are female. Student-teacher ratios tend to be higher in the T schools (41 students per teacher) compared to C group schools (34 students per teacher); however, the differences are not statistically significant. Teachers in both schools were absent, on average, only one day in the month prior to data collection (Table VI.5).

There is a statistically significant difference between the two intervention groups in terms of the percentage of teachers with permanent positions. Teachers in the T group are 5 percentage points more likely to have a permanent teaching position compared to teachers in the C group, a statistically significant difference (Table VI.5). Also, teachers in the C group are more likely to hold a temporary contract (*personal por contrato*), but this difference is marginally significant at the 10 percent level only.

Table VI.5. Teacher characteristics by treatment group

	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Female teachers (percentage)	41.0	41.3	-0.3	0.92
Teachers by type of contract (percentage)				
Permanent position (Rank 011)	7.9	2.9	5.0**	0.02
Temporary position (in Spanish: "personal supernumerario", Rank 021[23])	32.3	30.8	1.5	0.74
Temporary position (in Spanish: "personal por contrato", Rank 022)	30.5	38.4	-7.9*	0.07
Teachers in training (percentage)	0.9	0.7	0.2	0.73
Other type	28.4	27.2	1.2	0.78
Seventh grade student-teacher ratio by subject				
Mathematics	40.7	33.6	7.1	0.20
Language and communication	41.2	34.1	7.1	0.24
Natural sciences	41.3	34.7	6.6	0.23
Teachers attended the most recent work day (percentage)	94.1	95.8	-1.7	0.29
Number of days teachers were absent in the last month, by subject				
Mathematics	0.8	1.0	-0.2	0.51
Language and communication	0.8	1.0	-0.2	0.47
Natural sciences	0.8	0.9	-0.1	0.70
Total number of schools	**158**	**173**		

Source: Baseline School Director Survey 2018

Notes: Columns A and B present regression-adjusted group means from regressions that include binary indicators to account for the strata used in the random assignment design. Multilevel linear models were used to account for the clustering of schools in school districts. "Other type" of contract includes teachers supported by the community (for example through parent organizations), the municipality, cooperatives, NGOs, and volunteer teachers, among others.

*Difference in group means is marginally significant at the .10 level.

**Difference in group means is statistically significant at the .05 level.

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[23] Rank 21 refers to teachers who are temporarily contracted for work with functional titles that, due to the temporary need in Public Institutions, are created **only for the fiscal year**. At the end of the fiscal year, the Nominating Authorities will assess if there is still a justified need for this type of personnel for the following fiscal year. Rank 022 refers to expenditures for basic salary public workers, hired for services, works and constructions of temporary nature, in which in **no case will contracts exceed the period that lasts the service, project or work**; and, when these cover more than a fiscal year, the contracts must be renewed for the new fiscal year.

After analyzing the teacher characteristics reported by school directors, we examined additional characteristics reported by teachers themselves. **These results show that teachers across intervention groups are equivalent in terms of gender, language spoken, level of education, and total years of teaching experience** (Tables VI.6–VI.8). Mathematics teachers in our sample tend to be male, communication teachers are slightly more likely to be female, and science teachers are balanced in terms of gender. Teachers have approximately 11 years of teaching experience and have at least a PEM or technical degree (Box VI.1). Most teachers in the sample speak Spanish as their mother tongue, but 20 to 25 percent report speaking a local language as their mother tongue, and not Spanish (note, however, that these teachers may speak Spanish as a second language). Some teacher characteristics vary according to the subject taught, but there are few significant differences between T and C groups. Below, we describe the differences between study groups by subject.

> **Box VI.1. Characteristics of the average teacher in the study sample**
>
> **Gender:** Primarily male for mathematics, balanced for the other subjects
>
> **Average years of experience:** 11
>
> **Typical education level:** PEM or technical degree
>
> **Primary language is Spanish:** 75%

Mathematics teachers in the T group have about seven years of teaching experience in their school, compared to roughly five and a half years in the C group. This difference is relatively small (just two years) but is statistically significant at the 5 percent level (see Table VI.6). This difference may be associated with differences between the groups in the proportion of teachers who hold permanent versus temporary positions (see Table VI.5).

Table VI.6. Characteristics of mathematics teachers in the study sample at baseline, by treatment group

Mathematics	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Female (percentage)	29.5	36.4	-6.9	0.13
Speaks Spanish as mother tongue (percentage)	71.3	75.4	-4.1	0.33
Speaks a local language as mother tongue, exclusive of Spanish (percentage)	28.7	24.6	4.1	0.33
Highest level of education completed				
Upper secondary	17.3	19.9	-2.6	0.51
High school teaching degree (PEM or technical university)	56.7	58.7	-2.0	0.72
Bachelor degree in Education (includes pedagogy)	23.3	18.4	4.9	0.33
Years of teaching experience in total	11.3	10.9	0.4	0.50
Years teaching at current school	7.2	5.4	1.8**	0.03
Probability that household lives in extreme poverty	3.2	2.8	0.4	0.66
Total number of teachers	**153**	**165**		
Total number of schools	**153**	**165**		

Source: Baseline School Teacher Survey 2018

Notes: Columns A and B present regression-adjusted group means from regressions that include binary indicators to account for the strata used in the random assignment design. Multilevel linear models were used to account for the clustering of teachers in school districts. Teachers who speak a local language as their

mother tongue, exclusive of Spanish, may be proficient or fluent in Spanish as a second language. The probability of living in extreme poverty was calculated following guidelines from Innovations for Poverty Action (http://www.povertyindex.org/).

**Difference in group means is statistically significant at the .05 level.

Language and communication teachers in the T group are more likely to be women (54 percent and 45 percent in the T and C groups, respectively), and this difference is statistically significant. Teachers in the T group are also 13 percentage points more likely to have a Bachelor's degree in education than teachers in the C group, a difference that is statistically significant. Teachers who teach communication are primarily Spanish speakers, but 20 to 25 percent of teachers in the two groups speaks a local language as their mother tongue. Table VI.7 summarizes the results of our analysis.

Table VI.7. Characteristics of communication teachers in the study sample at baseline, by treatment group

Language and Communication	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Female (percentage)	54.6	44.6	10.0**	0.04
Speaks Spanish as mother tongue (percentage)	80.1	75	5.1	0.15
Speaks a local language as mother tongue, exclusive of Spanish (percentage)	19.9	25	-5.1	0.15
Highest level of education completed				
Upper secondary	15.7	19.9	-4.2	0.27
High school teaching degree (PEM or technical university)	49.6	58.4	-8.8	0.14
Bachelor degree in Education (includes pedagogy)	32.0	19.7	12.3**	0.04
Years of teaching experience in total	12.0	11.4	0.6	0.48
Years teaching at current school	6.5	5.6	0.9	0.11
Probability that household lives in extreme poverty	3.9	3.7	0.2	0.86
Total number of teachers	**137**	**153**		
Total number of schools	**137**	**153**		

Source: Baseline School Teacher Survey 2018

Notes: Columns A and B present regression-adjusted group means from regressions that include binary indicators to account for the strata used in the random assignment design. Multilevel linear models were used to account for the clustering of teachers in school districts. Teachers who speak a local language as their mother tongue, exclusive of Spanish, may be proficient or fluent in Spanish as a second language. The probability of living in extreme poverty was calculated following guidelines from Innovations for Poverty Action (http://www.povertyindex.org/).

**Difference in group means is statistically significant at the .05 level.

Similar to communication teachers, nearly half of the natural sciences teachers in our sample are female. Most of these teachers speak Spanish as their mother tongue (81 percent and 79 percent in the T and C groups, respectively). Over half of these teachers have a PEM or technical degree, and an additional 22 to 24 percent have a Bachelor's degree. There are small differences between the T and C groups, but none are statistically significant except for years of experience at the current school, which may be associated with the difference in the proportion of teachers who hold permanent versus permanent positions (see Table VI.5). Natural sciences teachers in

the T group have seven years of experience at their current school compared to five years of experience for teachers in C schools. This difference is significant at the 5 percent level (Table VI.8).

Table VI.8. Characteristics of natural sciences teachers in the study sample at baseline, by treatment group

Natural sciences	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Female (percentage)	49.1	45.0	4.1	0.48
Speaks Spanish as mother tongue (percentage)	81.1	79.0	2.1	0.60
Speaks a local language as mother tongue, exclusive of Spanish (percentage)	18.9	21.0	-2.1	0.60
Highest level of education completed				
Upper secondary	20.9	16.5	4.4	0.28
High school teaching degree (PEM or technical university)	52	57.5	-5.5	0.35
Bachelor degree in Education (includes pedagogy)	22.5	24.3	-1.8	0.74
Years of teaching experience in total	11.5	10.6	0.9	0.32
Years teaching at current school	7.0	5.3	1.7***	0.00
Probability that household lives in extreme poverty	2.8	3.0	-0.2	0.79
Total number of teachers	**134**	**151**		
Total number of schools	**134**	**151**		

Source: Baseline School Teacher Survey 2018

Notes: Columns A and B present regression-adjusted group means from regressions that include binary indicators to account for the strata used in the random assignment design. Multilevel linear models were used to account for the clustering of teachers in school districts. Teachers who speak a local language as their mother tongue, exclusive of Spanish, may be proficient or fluent in Spanish as a second language. The probability of living in extreme poverty was calculated following guidelines from Innovations for Poverty Action (http://www.povertyindex.org/).

***Difference in group means is statistically significant at the .01 level.

Baseline equivalence in student characteristics

We used students' self-reported data to examine differences between the intervention groups on student socio-demographic characteristics. **The intervention groups are equivalent in all but one student characteristic tested during our analysis.** The percentages of boys and girls are similar in both groups. The average student is 14 years old and commutes to school on bike or foot (roughly three-quarters commute to school via bicycle or walking). About 60 percent speak Spanish as their mother tongue and about a third work for pay. On average, students in both groups have a 15 percent probability of living in extreme poverty. Less than a quarter have parents who completed high school.

Regarding education outcomes, a third have previously repeated a grade, and roughly 15 percent had temporarily dropped out of school at some point. We find a small statistically significant difference of 3.4 percentage points between the two groups in the percent of students who reported wanting to complete third grade of *básico*. Specifically, more students in the control group reported that they only want to complete up to third grade but not a higher level of education. There are, however, no differences between the groups in the percentage of students who reported wanting to complete a higher level of education.

Table VI.9. Student characteristics by treatment group

	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Demographic information				
Female (percentage)	42.2	43.9	-1.7	0.44
Age	13.8	13.8	0.0	0.94
Speaks Spanish as mother tongue (percentage)	58.0	60.0	-2.0	0.59
Speaks a local language as mother tongue, exclusive of Spanish (percentage)	42.0	40.0	2.0	0.59
Works for pay (percentage)	32.9	31.9	1.0	0.81
Walks or rides a bike to school	73.3	75.2	-1.9	0.65
Household socio-economic characteristics				
Probability that household lives in extreme poverty	14.9	14.8	0.1	0.97
Mother attended high school or a higher level of education	17.2	15.1	2.1	0.33
Father attended high school or a higher level of education	22.7	20.3	2.4	0.30
Education background				
Repeated a grade (percentage)	36.4	36.0	0.4	0.89
Temporarily stopped attending school before (percentage)	16.8	15.5	1.3	0.64
Wants to complete lower secondary school only (Ciclo básico, in Spanish)	10.1	13.5	-3.4**	0.05
Wants to complete a level of education higher than lower secondary school	87.2	84.6	2.6	0.18
Has a learning difficulty or physical disability that affects learning	54.6	51.6	3.0	0.38
Total number of students	**6,077**	**5,623**		
Total number of schools	**157**	**173**		

Source: MINEDUC Student Socio-demographic Questionnaire (Cuestionario de Factores Asociados–Estudiantes) 2018

Notes: Columns A and B present regression-adjusted group means from regressions that include binary indicators to account for the strata used in the random assignment design. Multilevel linear models were used to account for the clustering of students in school districts. Students who speak a local language as their mother tongue, exclusive of Spanish, may be proficient or fluent in Spanish as a second language. The probability of living in extreme poverty was calculated following guidelines from Innovations for Poverty Action (http://www.povertyindex.org/).

**Difference in group means is statistically significant at the .05 level.

B. Baseline equivalence in implementation outputs

The T and C groups are equivalent in terms of access to professional development opportunities, except for the number of times in which school directors received pedagogical support. School directors in the two groups had similar access to training opportunities, participated in an equal number of trainings or other professional development activities, and a similar proportion reported receiving pedagogical support in 2017. However, directors in the C group reported receiving support more times than those in the T group, a difference that is statically significant. In both groups, school directors reported receiving pedagogical support less than once a year (Table VI.10).

Table VI.10. School director access to professional development at baseline, by treatment group

	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Director professional development				
Participated in training or professional development last year (2017) (percentage)	57.2	50	7.2	0.18
Number of trainings or professional development activities attended last year (2017)	1.7	1.4	0.3	0.22
Number of topics covered in trainings attended last year (2017)	3.2	2.6	0.6	0.19
Received pedagogical support in 2017 (percentage)	19.6	25	-5.4	0.22
Number of times received pedagogical support in 2017	0.4	0.7	-0.3**	0.04
Total number of schools	**158**	**173**		

Source: Baseline School Director Survey 2018

Notes: Columns A and B present ordinary least squares regression-adjusted group means from regressions that include binary indicators to account for the strata used in the random assignment design. Multilevel linear models were used to account for the clustering of schools in school districts. We show the maximum number of schools in the analyses across all outcomes tested. Tests on number of trainings, topics covered in training, and number of times director received pedagogical support include directors who reported not having been trained/received support.

**Difference in group means is statistically significant at the .05 level.

Teachers' access to professional development activities is equivalent across four of the five characteristics measured by the baseline survey. Mathematics teachers in the T group were more likely to have participated in training or professional development activities in 2017 than teachers in the C group (51 percent compared to 40 percent, respectively). This result is statistically significant at the 5 percent level. Similarly, Language and communication teachers in the T group were nine percentage points more likely to have participated in professional development activities than C group teachers. However, the result is only marginally significant at the 10 percent level. Among communication teachers, T teachers attended nearly one more training than C teachers, on average. This difference is statistically significant at the 5 percent level. Communication teachers in the T group also reported being trained in nearly one more topic and receiving support slightly more frequently than teachers in the C group. These

differences were marginally significant at the 10 percent level. We found no significant differences among teachers of natural sciences.

Table VI.11. Teacher access to professional development at baseline, by subject and treatment group

Mathematics	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Teacher professional development				
Participated in training or professional development activities last year (2017)	50.8	39.6	11.2**	0.03
Number of trainings or professional development activities attended last year (2017)	1.1	0.9	0.2	0.27
Number of topics covered in trainings attended last year (2017)	2.2	1.8	0.4	0.24
Received pedagogical support in 2017 (percentage)	11.1	9.8	1.3	0.71
Number of times received pedagogical support in 2017	0.2	0.2	0.0	0.65
Total number of teachers	**153**	**165**		

Language and Communication	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Teacher professional development				
Participated in training or professional development activities last year (2017)	46	36.8	9.2*	0.08
Number of trainings or professional development activities attended last year (2017)	1.4	0.8	0.6**	0.04
Number of topics covered in trainings attended last year (2017)	2.4	1.7	0.7*	0.07
Received pedagogical support in 2017 (percentage)	10.5	5.9	4.6	0.13
Number of times received pedagogical support in 2017	0.4	0.1	0.3*	0.10
Total number of teachers	**137**	**153**		

Natural sciences	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Teacher professional development				
Participated in training or professional development activities last year (2017)	40.5	43.5	-3.0	0.54
Number of trainings or professional development activities attended last year (2017)	1.1	1.0	0.1	0.54
Number of topics covered in trainings attended last year (2017)	2.3	2.3	0.0	0.96
Received pedagogical support in 2017 (percentage)	10.3	10.8	-0.5	0.87
Number of times received pedagogical support in 2017	0.2	0.2	0.0	0.64
Total number of teachers	**134**	**151**		

Source: Baseline School Teacher Survey 2018

Notes: Columns A and B present regression-adjusted group means from regressions that include binary indicators to account for the strata used in the random assignment design. Multilevel linear models were used to account for the clustering of teachers in school districts. Analyses include one teacher per subject, per school. We show the maximum number of teachers in the analyses across all outcomes tested. Tests on number of trainings, topics covered in training, and number of times teachers received pedagogical support include teachers who reported not having been trained/received support.

*Difference in group means is marginally significant at the .10 level.

**Difference in group means is statistically significant at the .05 level.

Language and communication teachers in the T group were also more likely to be participating in a learning community at baseline than C teachers (9 percent compared to 4 percent, respectively). This result is statistically significant at the 5 percent level. There are no statistically significant differences between groups across the remaining characteristics related to involvement in school networks or learning communities (Table VI.12).

Table VI.12. School involvement in school networks and learning communities at baseline, by treatment group

	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
School belongs to a school network (percentage) (director report)	2.8	4.4	-1.6	0.44
School belongs to a learning community (percentage) (director report)	6.9	8.1	-1.2	0.66
Mathematics teacher participates in a learning community (percentage) (teacher report)	9.3	5.6	3.7	0.10
Communication teacher participates in a learning community (percentage) (teacher report)	9.3	4.1	5.2**	0.05
Natural sciences teacher participates in a learning community (percentage) (teacher report)	4.6	4.2	0.4	0.87
Total number of teachers	153	165		
Total number of schools	158	173		

Source: Baseline School Director and Teacher Surveys 2018

Notes: Columns A and B present regression-adjusted group means from regressions that include binary indicators to account for the strata used in the random assignment design. Multilevel linear models were used to account for the clustering of school directors or teachers in school districts. Analyses include one teacher included per subject, per school. We show the maximum number of teachers across all outcomes and subjects but sample sizes vary across subjects.

**Difference in group means is statistically significant at the .05 level.

C. Baseline equivalence in pedagogical practices

The transformation of school inputs into learning outcomes happens in the classroom, but how teachers make the transformation happen is often a black box and varies significantly from classroom to classroom. In this section, we analyze teachers' pedagogical practices and time on task in T and C schools.

Classroom observation sample description at baseline

We sampled up to three teachers per school, one from each subject (mathematics, language and communication, and natural sciences). We observed fewer natural sciences classrooms than mathematics and communication ones because natural science is taught less frequently than mathematics or communication and in one- and two-teacher schools, priority is often given to the latter two subjects.

Our treatment and control classrooms are equivalent across shifts observed, number of students at the beginning and end of class, and class duration. We find no statistically significant differences in the shifts observed between treatment and control classrooms by subject. Approximately one quarter of the T classrooms were observed during the morning shift and the remaining classrooms were observed during the afternoon or evening shift. The average duration of the classes was 1 to 2 minutes longer in C than T classrooms. The differences were statistically significant for communication and natural sciences. In both groups, class duration was slightly under 40 minutes, which is the minimum duration as required by the Ministry of Education (MINEDUC 2009). Similar results are reflected for the C group in Table VI.13, below.

Table VI.13. Characteristics of the sample for classroom observations, by treatment group

	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Mathematics				
Observed during morning shift	22.3	26.5	-4.2	0.41
Total number of students at the start of class	23.3	20.4	2.9*	0.06
Percentage of female students at the start of class	41.9	44.9	-3.0	0.16
Total number of students at the end of class	23.6	21.0	2.7*	0.07
Percentage of female students at the end of class	42.0	44.2	-2.2	0.28
Duration of class (in minutes)	35.9	37.1	-1.2	0.12
Total number of classrooms	**150**	**164**		
Total number of schools	**150**	**163**		
Language and Communication				
Observed during morning shift	22.0	25.9	-3.8	0.46
Total number of students at start of class	22.2	20.9	1.3	0.36
Percentage of female students at the start of class	43.7	43.6	0.0	0.99
Total number of students at the end of class	23.6	21.3	2.3	0.14
Percentage of female students at the end of class	41.9	43.4	-1.6	0.4
Duration of class (in minutes)	35.6	37.1	-1.5**	0.0
Total number of classrooms	**158**	**171**		
Total number of schools	**153**	**167**		
Natural Sciences				
Observed during morning shift	22.6	27.0	-4.5	0.4
Total number of students at start of class	23.1	21.4	1.7	0.2

	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Percentage of female students at the start of class	43.1	45.0	-1.9	0.4
Total number of students at the end of class	23.5	22.0	1.5	0.3
Percentage of female students at the end of class	42.4	45.2	-2.8	0.2
Duration of class (in minutes)	35.3	37.0	-1.69**	0.0
Total number of classrooms	**135**	**146**		
Total number of schools	**134**	**145**		

Source: Stallings Classroom Observations 2018

Note: Columns A and B present ordinary least squares regression-adjusted group means from regressions that include binary indicators to account for the strata used in the random assignment design. Multilevel linear models were used to account for the clustering of teachers in school districts. Regressions include sampling weights. We show the maximum number of classrooms and schools in the analyses across all outcomes tested, but sample sizes vary. Three classrooms observed were grade 8, the remaining were grade 7. Class duration represents the official class period duration.

*Difference in group means is marginally significant at the .10 level.

**Difference in group means is statistically significant at the .05 level.

We find differences in the number of students at the start and end of mathematics class, which are marginally significant at the 10 percent level. On average, mathematics classrooms in the T group started the period with 23 students compared to 20 students in C classrooms, a difference that is marginally significant at the 10 percent level. Treatment classrooms ended the class period, with 24 students compared to 21 students in control classrooms. The difference is marginally significant at the 10 percent level though it is small at face value (a difference of three students between the treatment and control groups). We also notice that, on average, the number of students at the start of classes is about the same as the average number of students at the end of classes for communication and natural sciences across both T and C classrooms. These results suggest that few students are arriving late or leaving class early in our sample schools.

Finally, we find statistically significant differences between the T and C groups in the duration of the communication and natural sciences classes. Despite being statistically significant, the differences are small: durations are 1.5 and 1.7 minutes, respectively (Figure VI.1). We find no statistically significant difference in the duration of mathematics between the two groups.

Figure VI.1. Classroom duration by subject and treatment group
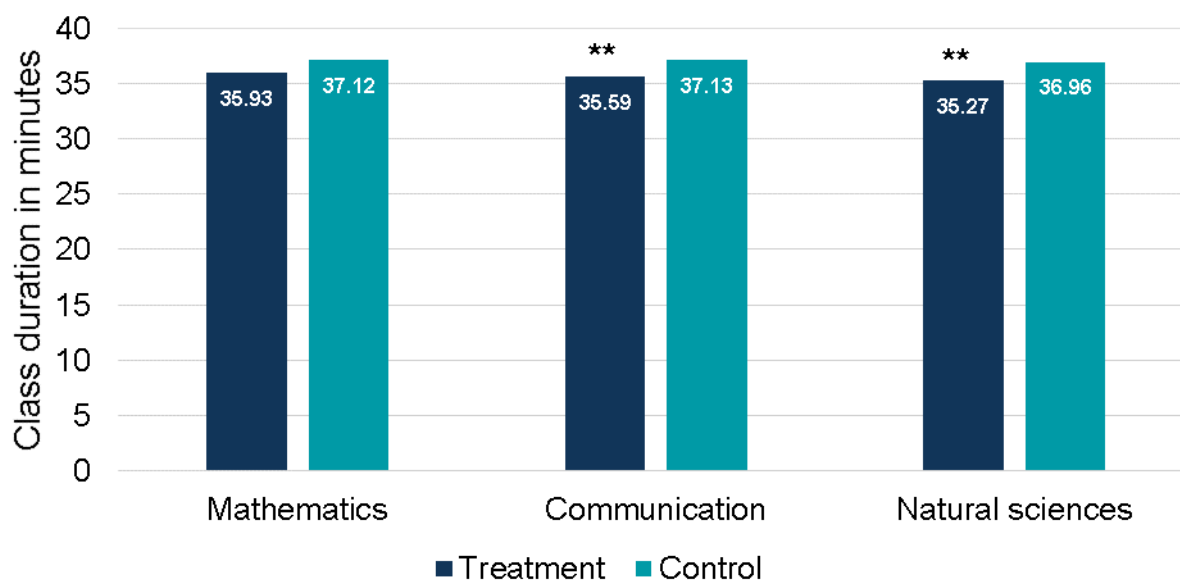
Note: **Difference in group means is statistically significant at the .05 level.

Teacher use of class time at baseline

Effective teachers spend most of their time on instruction, keeping the time spent on classroom management activities to a minimum and rarely spending any time off task (Bruns and Luque 2015). In Table VI.14, we show the average percentage of snapshots[24] teachers devoted to the three main activities by class subject: academic instruction, classroom management, and off task. Academic **instruction** comprises activities such as reading aloud, lecturing or class instruction, discussion/debate, learning by repetition, individual class assignment, and copying. **Classroom management** consists of activities such as discipline, classroom management with students' help, and classroom management alone. **Off -task activities** include social interaction (with students), a teacher in social interaction (with other adult) or not involved with students, and teacher out of the classroom. We classified each activity observed in one of the three main categories and calculated the percentage of 10 observation snapshots that treatment and control teachers spent on each activity. Using the snapshot duration, we also calculated the approximate time in minutes observed teachers spent on each main activity. These results are included in Tables VI.14, Appendix E and are discussed in the following section.

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[24] A Stallings snapshot refers to a 10-15 second observation of the classroom that is documented by the observer. The observer takes and records 10 snapshots during the length of the class, which are taken at specific intervals of time (e.g., every 4 minutes in a 40 minute class period).

We find no statistically significant differences between the treatment and control groups in teachers' use of instructional time at baseline. On average, mathematics teachers in T classrooms spent close to three-quarters of their time (72 percent, or 25 minutes out of 36 minutes average class duration) on academic instruction compared to 75 percent of the time in C classrooms. They spent an average of 15 percent (6 minutes) on classroom management and 13 percent (5 minutes) on off-task activities, which is similar to C classrooms. The distribution of time teachers devoted to these three activities during communication and science classes is very similar to the distribution for mathematics classes, with differences of only a few percentage points across the two groups. Natural sciences teachers in T spent about 3 percent more time on classroom management, compared to C teachers. This difference is only marginally significant, at the 10 percent level.

Table VI.14. Teachers use of time at baseline (percentage of snapshots), by subject and treatment group

Subject	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Mathematics				
Teachers' use of instructional time (percentage)				
Instruction	71.6	74.6	-2.9	0.12
Classroom management	15.7	14.3	1.4	0.31
Off task	12.9	11.2	1.7	0.40
Total number of classrooms	**150**	**164**		
Total number of schools	**150**	**163**		
Language and Communication				
Teachers' use of instructional time (percentage)				
Instruction	74.4	73.4	1.0	0.57
Classroom management	16.2	16.6	-0.4	0.76
Off task	9.4	9.9	-0.5	0.62
Total number of classrooms	**158**	**171**		
Total number of schools	**153**	**167**		
Natural sciences				
Teachers' use of instructional time (percentage)				
Instruction	71.8	72.2	-0.4	0.85
Classroom management	16.9	14.3	2.7*	0.09
Off task	11.3	13.5	-2.2	0.21
Total number of classrooms	**135**	**146**		
Total number of schools	**134**	**145**		

Source: Stallings Classroom Observations 2018

Note: Columns A and B present ordinary least squares regression-adjusted group means from regressions that include binary indicators to account for the strata used in the random assignment design. Multilevel linear models were used to account for the clustering of teachers in school districts. Regressions include sampling weights. We show the maximum number of classrooms and schools in the analyses across all outcomes tested, but sample sizes may vary.

*Difference in group means is marginally significant at the .10 level.

Teacher use of materials at baseline

To understand if there are differences in the types of materials teachers use in the classroom when they are engaged in academic instruction, we tested their use of six types of materials for each of the three subjects of interest. **We find that mathematics teachers in the T group spent significantly less time using textbooks than teachers in the C group.** We also find that science teacher in both T and C schools spent more time using textbooks, although there is a marginally significant difference between the two groups at the 10 percent level. In communication, teachers spent most of their time using textbooks in both classes; however, we find a statistically significant difference between T and C teacher' use of the blackboard. Treatment school teachers were five percentage points more likely to use the blackboard for instruction than teachers in the C group (19 percent and 14 percent, respectively). Table VI.15 shows the percentage of time that teachers spent using each type of material, by subject and treatment group.

Table VI.15. Teachers use of materials at baseline (percentage of class), by subject and treatment group

Subject	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Mathematics				
Used no materials	7.5	6.6	0.9	0.41
Used book/textbook	7.6	11.3	-3.7**	0.01
Used notebook	16.4	16.0	0.4	0.85
Used blackboard	34.7	34.5	0.2	0.93
Used didactic material	4.1	5.5	-1.3	0.23
Used information, communication, and technology (ICT)	1.4	1.1	0.3	0.66
Total number of classrooms	**150**	**164**		
Total number of schools	**150**	**163**		
Language and Communication				
Used no materials	13.3	14.1	-0.8	0.64
Used book/textbook	19.6	22.7	-3.1	0.22
Used notebook	13.7	13.5	0.2	0.88
Used blackboard	18.5	14.4	4.1*	0.05
Used didactic material	8.2	7.0	1.1	0.51
Used information, communication, and technology (ICT)	1.1	1.8	-0.6	0.27
Total number of classrooms	**158**	**171**		
Total number of schools	**153**	**167**		
Natural sciences				
Used no materials	15.9	15.6	0.3	0.86
Used book/textbook	19.0	23.6	-4.5*	0.05
Used notebook	12.5	13.2	-0.7	0.68
Used blackboard	11.4	9.6	1.8	0.30
Used didactic material	11.0	7.6	3.3	0.16
Used information, communication, and technology (ICT)	1.4	2.26	-0.8	0.35
Used science laboratory equipment	0.4	0.06	0.3	0.28
Total number of classrooms	**135**	**146**		
Total number of schools	**134**	**145**		

Source: Stallings Classroom Observations 2018

Notes: Columns A and B present ordinary least squares regression-adjusted group means from regressions that include binary indicators to account for the strata used in the random assignment design. Multilevel linear models were used to account for the clustering of teachers in school districts. Regressions include

sampling weights. We show the maximum number of classrooms and schools in the analyses across all outcomes tested, but sample sizes vary.

*Difference in group means is marginally significant at the .10 level.

**Difference in group means is statistically significant at the .05 level.

It is worth noting that the use of didactic[25] and information, communication and technology (ICT) materials by teachers is relatively low compared to the use of textbooks, notebooks, and the blackboard (Figure VI.2). Didactic materials were only used 6 to 5 percent of the time, which is typical in lower secondary schools. The use of lab equipment in natural sciences classes is also low – below 2 percent – across both treatment and control groups. This finding could be due to the unavailability of the lab equipment.

Figure VI.2. The average percentage of class teacher used materials, by treatment group
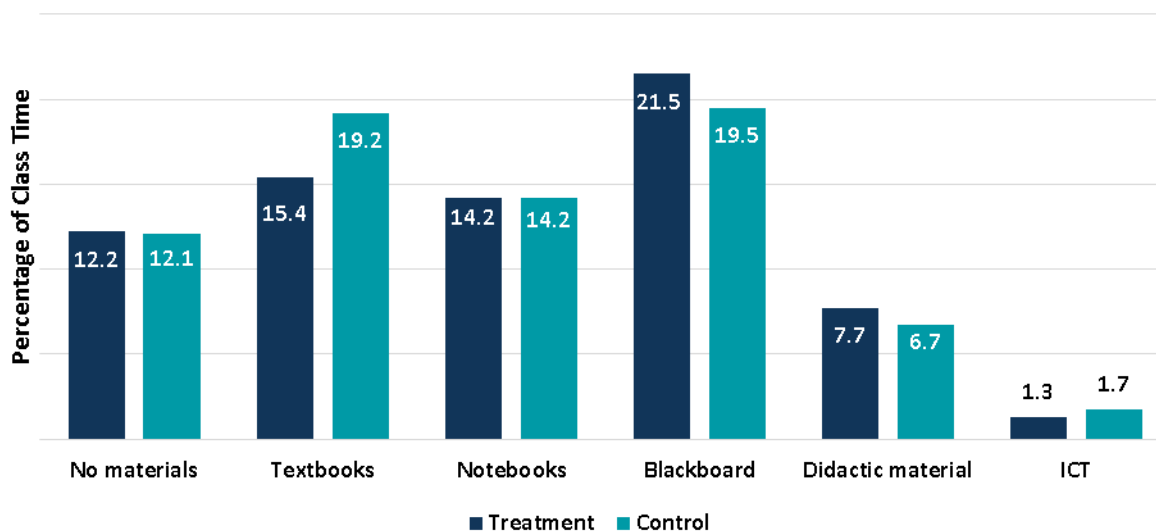
Note: The figure shows arithmetic means from descriptive statistics. We did not perform significance testing for differences between groups given the low frequencies for some of the categories.

Results indicate that both treatment and control teachers rely mostly on the use of blackboard, textbooks, and notebooks. The findings are consistent with findings from other research in the LAC region, which suggest that teachers continue to rely on a very traditional learning aid (blackboard) while many other learning materials available in LAC classrooms, including didactic and ICT materials, are not being used intensively by teachers (Bruns and Luque 2015).

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[25] The definition of "didactic" under the Stallings methodology refers to support materials used to enhancing teaching. It includes things such as manipulables. Blackboards are categorized separately.

Student engagement at baseline

Student engagement[26] with the teacher in the classroom is increasingly viewed as one of the keys to addressing problems such as low achievement, alienation, and high dropout rates (Fredricks et al. 2004). Table VI.16 shows the average percentage of time a large group of students or the entire class were engaged in activity with the teacher by subject and treatment group.

During mathematics classes, we find one marginally significant difference between T and C classrooms in the percentage of time that students engaged with the teacher in an academic activity. Students in the T group were five percentage points less likely to be engaged in large group academic activities than students in the C group (62 percent and 67 percent respectively). The difference is marginally significant at the 10 percent level. During the remaining 38 percent of the time for T and 33 percent for C classrooms, only one student or a small group were engaged in instruction with the teacher. We find no statistically significant differences between the groups in the percentage of time all or a large group of students were engaged with the teacher in classroom management or off-task activities during mathematics class.

During communication and natural science classes, there are no statistically significant differences in the percentage of time that a large group of students or the entire class engaged with the teacher in the three main activities (academic instruction, classroom management, or off-task activities such as social interaction). When the teacher was conducting classroom management during communication class, a large group of students or the entire class were engaged with the teacher in this activity an average of 12 percent of the time across both T and C classrooms. When the teacher was conducting science instruction, a large group of students or the entire class were engaged with the teacher in this activity, about 66 percent of the time across both T and C classrooms. During the remaining 34 percent of the time, only one student or a small group engaged in instruction with the teacher. The data in Table VI.16 show only one marginally significant difference between the study groups (academic instruction in mathematics), suggesting that T and C classrooms are largely equivalent at baseline.

In Appendix E, we provide descriptive information about the activities of students who were not engaged with the teacher. About 55–65 percent of the students who were not engaged with the teacher were not engaged in any instruction or classroom management activities. Approximately 30–38 percent were engaged in social interaction activities among themselves, and a quarter of the students were not involved in any classroom activities. The remaining students who were not engaged with the teacher were engaged in instruction or classroom management activities, with the majority of this group (10–15 percent) engaged in individual class assignments (seatwork). These results are similar across all three subjects.

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[26] The minimum number of classroom and school sample sizes by subject differ from the sample sizes presented in previous tables in this section. We calculated the percentage of snapshots a large group of students or the entire class were engaged in a specific activity with the teacher, using only the snapshots when the teacher was conducting this activity. Snapshots when teacher was not conducting the activity, including when he/she was conducting classroom management alone, was not involved with the students or was out of the classroom were excluded from the regression.

Table VI.16. Student engagement with the teacher at baseline (percentage of snapshots), by subject and treatment group

Subject	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Mathematics				
All students or a large group[27] engaged in academic activity with the teacher	62.4	67.1	-4.7*	0.07
All students or a large group engaged in management activity with the teacher	10.4	10.5	-0.1	0.91
All students or a large group off-task	6.9	6.5	0.3	0.87
Total number of classrooms	**149**	**164**		
Total number of schools	**149**	**163**		
Language and Communication				
All students or a large group engaged in academic activity with the teacher	68.2	67.2	1.0	0.56
All students or a large group engaged in management activity with the teacher	12.5	12.1	0.4	0.71
All students or a large group off-task	6.7	8.2	-1.5	0.37
Total number of classrooms	**158**	**171**		
Total number of schools	**153**	**167**		
Natural sciences				
All students or a large group engaged in academic activity with the teacher	66.2	66.4	-0.2	0.93
All students or a large group engaged in management activity with the teacher	14.4	12.7	1.7	0.16
All students or a large group off-task	9.9	9.2	0.7	0.74
Total number of classrooms	**134**	**146**		
Total number of schools	**133**	**145**		

Source: Stallings Classroom Observations 2018

Note: Columns A and B present ordinary least squares regression-adjusted group means from regressions that included binary indicators to account for the strata used in the random assignment design. Multilevel linear models were used to account for the clustering of teachers in school districts. Regressions include sampling weights. We show the maximum number of classrooms and schools in the analyses across all outcomes tested, but sample sizes vary. The percentage of time when all students or a large group were engaged with the teacher in a specific activity is calculated using the number of snapshots related to the activity divided by the total class time. For mathematics, a minimum of 22 classrooms and schools were observed in the treatment group and 27 in the control group. For communication, a minimum of 24 classrooms and schools were included in the treatment group and 23 in the control group. For science, a minimum of 24 classrooms and schools were included in the treatment group and 30 in the control group.

*Difference in group means is marginally significant at the .10 level.

D.   Baseline equivalence on student academic (medium-term) outcomes

Measuring student outcomes is a key component to education, allowing teachers to understand what students are learning, where they continue to struggle, and if they are ready to move on to other grades. Measuring student outcomes is a key focus of the GEP program, which has developed new learning assessments for understanding learning gains over time.

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[27] A large group of students refers to 6 or more in a classroom.

Student promotion, repetition, and dropout

The study groups are balanced in terms of grade repetition and school dropout rates. However, we find statistically significant differences in promotion rates. On average, teachers promoted 78 percent of students in study schools to the next grade at the end of the 2017 school year. However, students in the C group were four percentage points more likely to be promoted than students in the T group were. This difference is statistically significant. Higher promotion rates among 8th graders (and among 7th graders, to a lesser extent) appear to be driving the overall difference between the T and C groups. Among 8th graders, teachers promoted 80 percent of students in the C group to the next grade, compared to 75 percent in the T group. This difference of 5 percentage points is statistically significant. Among 7th graders, there is a difference of 4 percentage points (79 percent of students in the control group are promoted, compared to 75 percent in the treatment group), but it is marginally significant at the 10 percent level only. The two groups are equivalent in the rate at which 9th graders are promoted to the next grade level (see Table VI.17).

No more than 6 percent of students were held back or dropped out of school in both groups and across all grades. Repetition and dropout rates appear lower among 9th graders compared to students in 7th and 8th grades.

Table VI.17. Student promotion, repetition, and dropout rates at baseline, by treatment group

	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Promotion rate				
Overall	78.0	82.2	-4.2**	0.02
Grade 7	75.1	79.1	-4.0*	0.07
Grade 8	75.0	80.3	-5.3***	0.01
Grade 9	86.6	88.8	-2.2	0.17
Repetition rate				
Overall	4.3	4.3	0.0	0.96
Grade 7	5.6	5.9	-0.3	0.72
Grade 8	4.5	4.0	0.5	0.56
Grade 9	2.7	2.6	0.1	0.87
Dropout rate				
Overall	4.5	4.2	0.3	0.67
Grade 7	5.3	5.2	0.1	0.92
Grade 8	4.6	4.1	0.5	0.52
Grade 9	2.7	2.7	0.0	0.99
Total number of schools	**158**	**173**		

Source: DIPLAN Administrative data 2017

Notes: Columns A and B present regression-adjusted group means from regressions that include binary indicators to account for the strata used in the random assignment design. Multilevel linear models were used to account for the clustering of students in school districts. Due to missing data, the number of schools included in the estimation sample ranges from 323 to 331 schools.

*Difference in group means is marginally significant at the .10 level.

**Difference in group means is statistically significant at the .05 level.

***Difference in group means is statistically significant at the .01 level.

Student academic performance

Students' academic performance is balanced across the two study groups in mathematics, communication, and natural sciences assessments. On average, 7th graders in both groups answered less than half of the questions correctly for the three subjects (see Table VI.18). Performance is lowest in mathematics, where students answered a third of the questions correctly, compared to close to 40 percent of correct questions in natural sciences and 45 to 46 percent in communication.[28] Our subgroup analyses are located in Appendix D.

Table VI.18. Student academic outcomes at baseline, by treatment group

	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value	Total number of students
Mathematics (percent correct)	31.1	29.7	1.4	0.10	7,760
Language and communication (percent correct)	43.8	43.7	0.1	0.93	7,823
Natural sciences (percent correct)	36.7	36.2	0.5	0.71	7,913
Total number of students	**4,109**	**3,804**			**11,748**
Total number of schools	**158**	**173**			**331**

Source: Student Assessments (*Pruebas Avanzo)* 2018, DIGEDUCA

Notes: Columns A and B present regression-adjusted group means from regressions that include binary indicators to account for the strata used in the random assignment design. Multilevel linear models are used to account for the clustering of students in school districts. The number of students in the estimation sample ranges from 7,760 to 7,913 due to variation in the number of students who took each assessment. 11,748 is the number of students who were assessed in at least one of the three subjects.

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[28] Conclusions are the same when using ability scores instead of percentage correct scores as outcomes.

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VII.   DISCUSSION OF BASELINE FINDINGS FOR THE IMPACT EVALUATION

In this report, we assess the balance in study group characteristics and identify initial differences between the T and C groups in the impact evaluation sample. We collected the baseline data before the roll-out of Éxito Escolar. Baseline data collection took place as planned, and the response rate at the school level was nearly 100 percent.

We find that the T and C groups are balanced in most characteristics measured at baseline,[29] including (1) school characteristics such as school size and school directors' and teachers' gender, language, and level of education and experience; (2) all but one measure of teachers' use of instructional time and materials (mathematics teachers in the treatment group spent significantly less time using books than control teachers); and (3) students' socio-demographic characteristics and academic performance on mathematics, communication, and natural sciences. Below, we highlight the differences we find among the remaining characteristics and discuss how the results affect the interpretation of the findings and future data collection efforts.

There is a statistically significant difference between the T and C groups in the proportion of schools in two out of five modalities. Specifically, a significantly higher percentage of treatment schools are INEB (21 percent versus 11 percent in the T and C groups, respectively) and a significantly lower percentage are Telesecundaria (43 percent versus 54 percent, respectively). In Guatemala, INEB schools tend to operate in urban areas and have teachers who specialize in specific subjects. In contrast, Telesecundaria schools are often located in rural areas and have only one teacher per grade or section. Teachers in Telesecundaria schools also rely on audiovisual or written materials to support instruction, although such materials are not always available or are incomplete. The differences between the T and C groups in the proportion of schools from different modalities could make it difficult to interpret endline differences in student outcomes. INEB schools presumably have better learning conditions than the Telesecundarias. As a result, students in INEB schools, which are overrepresented in the T group, could outperform students in Telesecundaria schools in the absence of Éxito Escolar. Therefore, if we find that T students outperformed C students at endline, it would be unclear if the difference is due to the composition of the sample (and imbalance in modalities) or the impact of the intervention. Although we do not find differences in student performance at baseline, we will control for the differences in modalities among the T and C groups in the regression equation at endline.

Treatment schools in the sample have marginally better classroom conditions than control schools. Students in both the T and C groups lack desks and chairs and face challenges of insufficient light and ventilation as well as the presence of smoke, dust, and noise. These factors can make it difficult for students to see, hear, and be comfortable enough in the classroom to learn. We find that these classroom conditions are marginally worse in C schools and hypothesize that these differences are driven by the lower proportion of INEB schools and higher proportion of Telesecundaria schools in the C group.

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[29] We find no statistically significant (or marginally significant) differences in 152 out of 187 characteristics tested.

Teachers in T schools are significantly more likely to have a permanent teaching position (as opposed to a fixed-term contract) than teachers in C schools, but are similar on other background characteristics. Teachers with permanent teaching positions are generally employed under different terms than contract teachers. In Guatemala, contract teachers are more susceptible than permanent teachers to experiencing salary delays, particularly when their contracts are being renewed for the next academic year (Inter-American Dialogue 2015). Furthermore, contract teachers have less job security than permanent teachers. Our baseline findings indicate that teachers in the T and C groups are largely equivalent in other background characteristics, including gender, level of education, and total years of teaching experience, as well as in their use of class time. We also find no statistically significant differences between the groups on student learning outcomes, which suggests that differences in teachers' contract types did not lead to observable baseline differences in this evaluation's primary outcomes. Overall, our baseline data provide little evidence that difference in contract type underlies other important (observed) differences between T and C. Nonetheless, we should bear this difference in mind when interpreting the endline results because schools with more contract teachers are likely to experience more turnover over time. High turnover rates can mitigate the impacts of teacher professional development programs and potentially lead to positive biases in favor of treatment schools.

Teachers in T schools are also significantly more likely to have participated in professional development activities and learning communities than teachers in C schools. More mathematics and communication teachers in the T group report participating in professional development activities than those in the C group (11 and nine percentage points difference, respectively), although the number of trainings attended appears to be low overall (one training, on average). Communication teachers in the T group are also more likely to report participating in a learning community than C teachers (a difference of 5 percentage points).[30] These findings could be related to the differences in contract type (permanent teachers may have more access to professional development opportunities), but also to the fact that more T teachers are in INEB schools, for which professional development activities and the ability for teachers to support each other may be more accessible. These differences could hinder our ability to disentangle the effects of Éxito Escolar from the effect of preexisting differences in teacher access to professional development and peer support. However, as noted above, baseline data collected for this evaluation indicate that teachers in the T and C group are equivalent in most measured characteristics. If these differences in professional development opportunities are relatively recent; however, their effects may not yet be reflected in teacher practices and student outcomes. Our endline surveys will ask teachers about professional development activities and peer support during the study so that we can adjust for the potential effect of differential access to professional development and peer support in our estimation of impacts. We will also gather qualitative data through the implementation study so we can gain further insights into teachers' perceptions of the professional development program.

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[30] Teachers were asked about their participation in learning communities, defined as a strategy for continual teacher training in which teachers work together and support each other to improve educational practices.

We find that the study groups are balanced in terms of student enrollment, grade repetition and school dropout, but differ significantly in student promotion rates. Even though teachers promoted most students in both groups to the next grade (over 70 percent on average), students in the C group are four percentage points more likely to be promoted than students in the T group. This finding is driven by a statistically significant difference of 5 percentage points among 8th-graders and a marginally significant difference of 4 percentage points among 7th-graders (there is no difference between 9th-graders in T and C schools). Qualitative data collection can help us understand whether these differences are linked to different promotion policies by modality or by another characteristic. As with other variables where we find statistically significant baseline differences between T and C, we plan to include school promotion rates as covariates in our impact estimation models to adjust for this imbalance. We will adjust for the imbalance in promotion rates by controlling for differences in modality if promotion rates are highly correlated with modality.

There are no statistically significant differences in student performance (our main outcome of interest), and the differences we find in other characteristics are likely due to chance. However, the differences observed at baseline could limit our ability to draw definitive conclusions about the impact of Éxito Escolar on student outcomes. The differences described above, which are likely driven by differences in the distribution of schools of different modalities, could lead to differences in student academic performance even though we do not observe such differences at baseline. Our random assignment strategy stratified by the department and by students' reading and mathematics performance to ensure balance on those key characteristics. We were unable to stratify by school modality for two reasons: (1) data on school modality were not readily available at the time of randomization and (2) even if data had been available, randomization at the district level would have made it difficult to stratify by modality because districts include schools in several modalities. These differences are likely due to chance given the nature of our randomized design.

We will use several strategies to address baseline imbalances, including statistical adjustments and sensitivity analysis. Our impact analysis includes as covariates the variables that differed significantly at baseline. The inclusion of these variables ensures that the estimated impacts reflect the effect of the intervention adjusting for baseline imbalances and not the effect of any initial differences between the groups. We will also conduct some limited sensitivity analyses (depending on resources) without controlling for these differences to determine if our findings are sensitive to variations in model specification and, if so, by how much. We will also examine impacts separately for INEB and Telesecundaria schools to explore whether findings follow the same overall trends as impacts for the full sample. Finally, we will consider including weights to offset the difference in school modalities between the groups. If we pursue this approach, we will give underrepresented school types stronger weights in each treatment group (that is, give larger weights to Telesecundaria schools and smaller weights to INEB schools in the T group and the reverse for those school types in the C group). The weighting process will help us determine the extent to which the differences in modalities affects our results.

Two additional limitations are noteworthy. MINEDUC developed and administered the standardized student tests *(Pruebas Avanzo)* used to test baseline equivalence for this evaluation. As described in the report, the tests offered evidence that the T and C groups are equivalent to the primary outcomes of the evaluation. It is worth noting, however, that the tests included

questions about topics that teachers had not presented to students at the time of baseline data collection (4 to 5 months into the school year). Students could not have answered all questions correctly. This limitation is expected to affect the T and C groups equally and therefore, does not bias our baseline equivalence estimates. At endline, data collection will take place at the end of the school year, and we will be able to assess the extent to which students have mastered grade-level content.

Second, we find large discrepancies between the numbers of students who took the student assessments and the number of students enrolled in 7th grade (based on school director reports). It is clear from the data that not all 7th grades students completed the assessments. Steps should be taken to ensure that all students enrolled in a school also complete the student assessment and that MINEDUC documents the reasons for nonresponse. If few students are missing and the level of missingness does not differ significantly between the study groups, this may not pose a serious threat to the validity of the study. However, if only the brightest students or students with higher attendance are tested, nonresponse may hinder our ability to draw valid conclusions about the impacts of Éxito Escolar and students' academic performance in general.

VIII.   IMPLEMENTATION FINDINGS FOR ÉXITO ESCOLAR

The overarching goal of Éxito Escolar, one of three activities under the GEP, is to support efforts by the Guatemalan government to implement institutional reforms as defined in the Proposal for the Transformation of Lower Secondary Education (Asturia de Barrios 2014) and the *Ruta Crítica (*MINEDUC 2014). These documents emphasize the provision of equitable and high-quality secondary education that prepares youth for the labor market (MINEDUC 2014). The theory of change for Activity 1 (below) highlights short-, medium- and long-term outputs and outcomes of the activity, including increasing teacher competencies and time on task, implementing school-level action plans, and disseminating information about secondary education. This report assesses FHI 360's progress towards the short- and medium-term outputs and outcomes in the theory of change (Figure VIII.1).

Figure VIII.1. Theory of Change, Activity 1
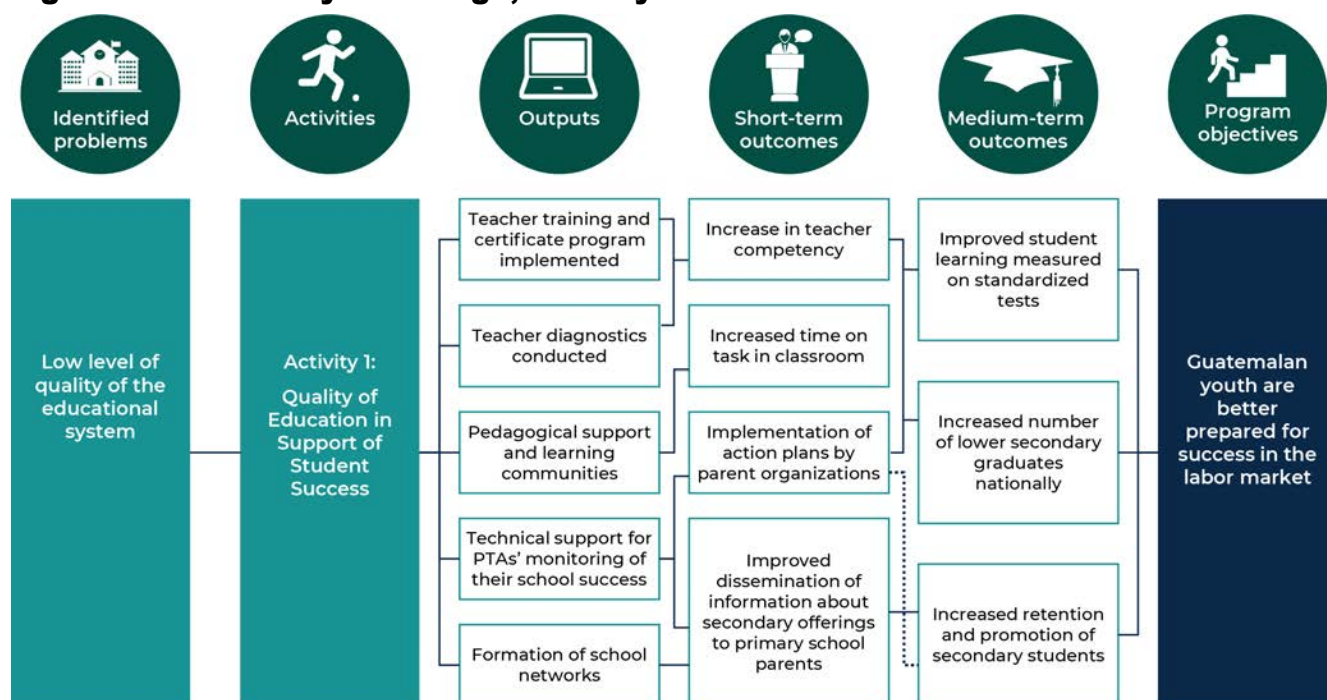
A. Was Éxito Escolar implemented as planned?

This section of the report summarizes progress in the implementation of Activity 1 as of March of 2019. Data collection for the implementation occurred about six months after the beginning of the in-service educator training, PADEP/CB. FHI360, in collaboration with MINEDUC and PRONACOM, made substantial progress towards the short- and medium-term outputs and outcomes specified in the theory of change (see Figures VIII.1 and VIII.2). FHI360 designed four PADEP/CB programs; designed and implemented a diagnostic test to assess educators' baseline competencies; trained university staff to deliver the PADEP/CB; and trained pedagogical and management advisors to support educators in the program. FHI360 is starting to provide technical assistance to the parent organizations, and the establishment of school networks is underway. For a variety of reasons, FHI360 has experienced delays in designing and initiating the implementation of Éxito Escolar activities. We elaborate the causes of these delays

in this section. The delays led to a six- to eight-month postponement in the implementation timeline (Table VIII.1). FHI360 also had trouble recruiting enough teachers and school directors to participate in the PADEP/CB program, as well as qualified personnel to serve as pedagogical and management advisors. Six to seven months into the program, we are not yet able to determine how these interventions are meeting the short- and medium-term goals of Éxito Escolar because the program has not been functioning long enough. We will measure these outcomes at the end of 2020. In the rest of this section, we describe the implementation status of each sub-activity under Activity 1.

Figure VIII.2. Implementation Timeline

August 2018
PADEP/CB begins

January 2019
Learning communities
start to operate

November 2017
School districts assigned to treatment or control group

February 2018
PADEP/CB academic plan designed and approved

May 2018
Pedagogical and management advisors trained

May—July 2018
Baseline data collection—impact study

August 2018
University instructors trained at the central level

September 2018
University instructors trained at the departmental level

October 2018
Diagnostic pre-tests administered to PADEP/CB participants

January 2019
Communication campaign (radio announcements and flyers distributed)

March 2019
Data collection—implementation study

Program for Professional Development of Lower Secondary Teachers (PADEP/CB). A primary component of Éxito Escolar is a new in-service professional development program to improve educator's competencies in the Ciclo Básico. The original in-service training component included the development of three diplomado programs for two cohorts of teachers and school directors (1200 teachers and directors per cohort), as well as pedagogical and management advisors.[31] Each cohort was expected to complete 600 hours of instruction. FHI360 was also expected to design a leveling program (propedeutico, in Spanish) for teachers and directors who wanted to participate in the diplomado, but who did not achieve the required minimum score in the PADEP/CB entry exam. FHI360 began developing the diplomado programs in 2016 with input from MINEDUC, PRONACOM, and other stakeholders. FHI360, in coordination with MINEDUC and PRONACOM, also planned to develop an agreement for three local universities to deliver the diplomado.

In late 2017, FHI360 agreed to substitute the diplomados with four *profesorado* programs in response to input from several stakeholders—including personnel at MINEDUC and departmental directorates—who indicated that educators were not interested in pursuing diplomado programs, and also in response to recent requirements by MINEDUC for Ciclo Básico teachers to become subject specialists. The final PADEP/CB would only have one cohort of teachers and school directors who would complete the program in 19 months.

The shift from diplomado programs to PADEP/CB required FHI360 to develop a higher volume of materials and caused substantial delays to the implementation process. Implementers also learned that since the PADEP/CB would only include one cohort, it was no longer practical to provide the leveling program to directors and teachers who, according to the original plan, would have participated in the second cohort of the diplomado. FHI360 faced additional challenges when one of the implementing universities dropped out of the program. The loss of that university meant that PRONACOM had to procure another university, which delayed the start of the PADEP/CB even further.

The universities designed the final PADEP/CB to be an intensive 19-month program (delivered over four semesters). The program consists of training in four areas of specialization: leadership and management, language and communication, mathematics, and natural sciences. Depending on the area of specialization, the program requires 643 to 700 hours of in-person training, plus 787 to 856 hours of online training. PADEP/CB is designed to increase educators' competencies in areas including pedagogical leadership, planning, didactic and pedagogical management, and formative evaluation methods. The program also seeks to develop educators' ability to embed cross-cutting themes into their teaching of academic content, including gender, multiculturality, project-based learning, opportunities to use technology, and early warning systems to prevent school dropout. The program draws its foundation from the *Curriculo Nacional Base* (CNB), which conceives of teaching as a social practice that takes place at three levels: the classroom, the school, and the community (FHI360 2018). PADEP/CB also includes a "pedagogic-didactic" lens, whereby the theoretical bases of each specialty are linked to educators' actual practices in the school or classroom.

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[31] The 3 diplomados were later revised to 4, as per the Informe trimestral from June to August 2017.

Table VIII.1. Éxito Escolar implementation progress, as of March 2019

Subactivity	Original Implementation Date	Actual Implementation Date	Accomplishment	2018	2019	Total	Goals Semesters 1 & 2	Percentage completion
Preparation	January, 2018	October, 2018	Teacher diagnostic assessment applied	1,552	n.a	1,552	**1,913**	**81%**
	October, 2017	February, 2018	PADEP/CB designed and approved	4	n.a	4	**4**	**100%**
	November, 2017	August 2018	*Ciclo Básico* schools with educators enrolled in PADEP/CB	578	545	545	**500***	**100%**
	December, 2017	August, 2018	Induction of university instructors at the central level, semesters I & 2 (in-person training hours)	32	16	48	**48**	**100%**
	December, 2017	August, 2018	Induction of university instructors at the central level, semesters I & 2 (online training hours)	0	6	6	**6**	**100%**
	December, 2017	September, 2018	Induction of university instructors at the departamental level, semesters I & 2 (in-person training hours)	16	12	28	**28**	**100%**
	December, 2017	September, 2018	Induction of university instructors at the departamental level, semesters I & 2 (online training hours)	0	2	2	**2**	**100%**
PADEP/CB	January, 2018	August, 2018	Number of Ciclo Básico teachers and directors trained	1,913	1,679	1,679	**1,800**	**93%**
Pedagogical and Management Support	December, 2017	May, 2018	Pedagogical advisors trained	46	55	55	**60**	**92%**
	December, 2017	May, 2018	Management advisors trained	27	37	37	**35**	**100%**
	February, 2018	August, 2018	Pedagogical advisors' visits to teachers in treatment schools	1,419	1,664	3,083	**3,982**	**77%**
	February, 2018	August, 2018	Management advisors' visits to directors in treatment schools	777	1,004	1,781	**2,448**	**73%**
School networks	March, 2018	n.a.	School networks established	0	0	0	**100**	**0%**
			Ciclo básico schools with a school network	0	0	0	**100**	**0%**
			Primary schools with a school network	0	0	0	**500**	**0%**

Subactivity	Original Implementation Date	Actual Implementation Date	Accomplishment	2018	2019	Total	Goals Semesters 1 & 2	Percentage completion
Teacher learning communities	November, 2017	January-March, 2019	Teacher learning communities established	0	131	131	**n.a.**	**n.a.**
	November, 2017	January-March, 2019	Ciclo Básico teachers and directors participating in learning communities	0	1,351	1,351	**1,800**	**75%**
Parent organizations	March, 2018	n.a.	Parent organizations supported** in Ciclo Básico schools with school networks	0	0	0	**100**	**0%**
			Parent organizations supported in Ciclo básico schools without school networks	0	0	0	**300**	**0%**
Radio	December, 2017	January, 2019	Radio spots scheduled	n.a.	160	160	**n.a.**	**n.a.**
Print media	December, 2017	February, 2019	Posters distributed	n.a.	2,740	2,740	**n.a.**	**n.a.**

Notes:
* The number of schools assigned to treatment is 631, but the goal as stated in the contract was 500 schools.
**Goal was revised from establishing parent organizations to supporting and reforming them because parent organizations already existed when the implementation started.
Source: FHI 360 quarterly progress reports.

All Ciclo Básico educators in school districts assigned to the treatment group were invited to participate in the program. Educators enrolled in their preferred subject of specialization, regardless of the subject they were teaching or their role at the school (for example, a math teacher could enroll in the leadership or natural sciences specializations). FHI360 used a train-the-trainer model to prepare five coordinators and 48 instructors from three implementing universities (Universidad del Valle de Guatemala, Universidad Panamericana, and Universidad InterNaciones) to deliver further training to university staff in the five departments. The coordinators and instructors received 54 hours of training. The coordinators then provided 30 hours of training to university instructors in each of the five departments.

PADEP/CB officially began in August 2018, about six months later than originally planned. The program will continue until August 2020. In the first semester, 1,913 educators from 631 Ciclo Básico schools enrolled in PADEP/CB. This number was lower than the original target of 2,400 but higher than the target of 1,800 trained educators that MCC defined in an amendment to FHI360's contract. As of March 2019, 1,679 educators (teachers and school directors) continued to be enrolled in the program, a 12 percent reduction relative to the first semester.

Pedagogical and management support. Another important feature of Éxito Escolar is the provision of pedagogical and management support to educators in PADEP/CB. The original plan was for the pedagogical advisors to participate in a diplomado program, but the contract was revised to offer an introduction and workshops to develop advisors' competencies. As of March 2019, FHI360 has started to train 55 pedagogical advisors and 37 management advisors. These pedagogical advisors visit schools and help PADEP/CB teachers implement the new pedagogic and management techniques, and management advisors help support community-level interventions, including developing school improvement plans and supporting parent organizations. From August 2018 until March 2019, the pedagogical advisors completed 3,083 visits (out of 3,982 planned visits), and the management advisors completed 1,781 visits (out of 2,448). The pedagogical advisors supported schools in developing improvement plans, organizing school governments, and conducted classroom observations.

Teacher learning communities. Teacher learning communities are a third feature of Éxito Escolar and focus on creating a safe space for educators to support each other through reflective learning. These learning communities are for educators currently enrolled in the PADEP/CB. They allow teachers to apply and practice their acquired knowledge, offering opportunities for participation and discussion of the theoretical-practical content and its contextualization based on the characteristics and culture of the communities, delivery methods, and areas of expertise of the participating educators (FHI360 2018). Implementers also hope the learning communities will help minimize educators' departure from PADEP/CB, and maximize professional performance in the areas of language and communication, mathematics, and natural sciences (FHI360 2018). All Ciclo Básico educators and directors participating in the professional development program were invited to participate in the learning communities. As of March 2019, around 80 percent (or 1,351) of educators enrolled in PADEP/CB are participating in learning communities.

School networks. School networks will create a link between one lower secondary school and up to five primary schools in the same school district. These networks are expected to facilitate the transition from primary to lower secondary school, promote the application of

concerted strategies to improve learning outcomes, and serve as a space for schools in the same district to exchange experiences and share resources (FHI360 2018). The project's goal was to establish 100 new school networks that would link at least five primary schools to one Ciclo Básico school. As of March 2019, implementers have worked to identify 100 Ciclo Básico schools that will serve as centers of the school networks. The team has made progress in forming four school networks (three in Chiquimula and one in Jalapa), but no networks have been fully established in the target Departments.

Parent organizations. The final key feature of Éxito Escolar is the creation of 100 parent organizations in Ciclo Básico schools with school networks and 300 parent organizations in Ciclo Básico schools without school networks. After conducting a rapid assessment of schools, FHI360 discovered that 392 parent organizations already existed throughout the five departments. However, those parent organizations mainly focus on managing financial resources provided by MINEDUC. The program seeks to expand the role of parent organizations to include developing school action plans to prevent student dropout, identifying measures for early warning alerts, and supporting students' academic attainment. FHI360 and MINEDUC have not created any parent organizations as of March 2019. Currently, the pedagogical and management advisors are working on organizing and strengthening parent organizations by refocusing their objectives to activities that would establish an early warning system for parents: emphasizing supporting their children in school, raising awareness about risks of school dropout, and encouraging regular reviews of children's grades. These and other activities were the focus of a massive social communication campaign in January–February 2019. The campaign consisted of two radio spots, one aimed at young people and the other aimed at parents; two pieces for social networks, one for young people and one for parents; and four posters, two directed at young people and two directed at parents.

B. What were the main facilitators of and barriers to implementing Éxito Escolar?

Strengthening Ciclo Básico through teacher professional development and support structures (that is, PADEP/CB, pedagogical support, learning communities, school networks, and parent organizations) is the core objective of the Éxito Escolar program. As noted, FHI360 has completed several activities and sub-activities to move toward the program's short- and medium-term outcomes. Along the way, several factors facilitate the implementation process. However, series of factors slowed the implementation process and forced program designers to rethink their approach to program interventions. These factors continue to interfere with the program's ability to achieve its goals. In the next section, we describe the facilitators and barriers of Éxito Escolar. We first discuss factors that have influenced the implementation of the program as a whole and then describe facilitators and barriers for each of the sub-activities.

Éxito Escolar benefitted from the institutional support of the Ministry of Education. MINEDUC and the directorates involved in Éxito Escolar mobilized human and material resources in support of the program. A board (*mesa técnica de alto nivel,* in Spanish) was convened to coordinate, harmonize, and make high-level decisions about program activities. The vice minister of education leads the board, which includes representatives from DIGECADE, DIGEESP, DIGEACE, DIGECUR, DIGEBI, PRONACOM, FHI360, as well as union members

(Sindicato de Trabajadores de la Educación, in Spanish) and delegates from the three universities delivering the PADEP/CB.

While involvement from MINEDUC and coordination with other stakeholders are seen as positive factors by those who participate on the board, two stakeholders asserted that political incentives drive some of the decisions made by the board. These decisions may be detrimental to the program's goals. For example, one non-member stakeholder indicated that the decision to anonymize the diagnostic test reduced the learning potential as educators advance through the program.

The program has been adapted and adjusted at multiple levels as stakeholders learned more about the target populations and about the staff involved in delivering the program. FHI360, with support from DIGEDUCA and PRONACOM, collected information about the conditions and needs of schools, educators, and students in the districts assigned to the treatment group. According to a few staff members at MINEDUC and FHI360, qualitative data revealed that there was less interest in the diplomado program than anticipated by program designers and the donor community. Teachers were more interested in participating in a *profesorado*, which is why the program changed focus. A member of the implementing organization noted, "*We did an exploration in the departments, and they said: a 'diplomado' for what? What we don't have are teachers with profesorados; we want a profesorado.*" As FHI360 learned about the high percentage of teachers in the target population who were not qualified to teach, designers of the program also decided to emphasize the academic leveling aspect of PADEP/CB, anticipating that teachers might bring knowledge gaps to the training.

University instructors also continued to incorporate new information and learning into the PADEP/CB program. An instructor from Chiquimula noted, "*Last year, the participants in the first semester were asked for a portfolio as their final assignment ... They noted their dissatisfaction regarding this assignment. This year the use of the portfolio was not implemented, but we attempted to improve or change the activity for another one that they feel is more useful.*" One individual at MINEDUC said the universities delivering PADEP/CB do not have experience working with the populations that are expected to benefit from the program—, specifically, educators from rural areas who work in public schools across the five modalities—, and might not be aware of their work and life conditions. As they learn more about the educators participating in PADEP/CB, instructors will continue to make adjustments to the program.

The adaptations described here respond to the needs of the population that is being served and are expected to improve the program. However, some of these modifications required numerous revisions to the program design and plans (for example, the curricular plans or "*mallas curriculares*" developed by FHI360) and those revisions have delayed the implementation timeline. The constant revision also weakens the dosage of the intervention. Adaptions are important in the implementation process, but they need to be balanced with consistency or the potential impacts and their interpretation could be affected at endline.

> "We tell the university that no fewer than two hours of practice in the communities of practice and learning. People say there is a university that decided it was half an hour, and what can we do? ... they themselves have their regulations to provide the credits"
>
> -Implementing staff

Information about the conditions and needs of the target population is outdated or incomplete. There is a consensus that Ciclo Básico has not received the attention and support from MINEDUC given to pre-primary and primary school. The current effort put forth by the GEP is unprecedented for Ciclo Básico. As a MINEDUC staffer noted, "*The Ciclo Básico had not received much attention for decades, right? eh… and the Ciclo Básico, which is part of the Nivel Medio, sees the light and an opportunity, through what ultimately is defined as the academic program of teacher professional development.*" Due to this relative lack of attention, updated and accurate information was not available when the program was originally envisioned about the conditions of schools, educators, and students in Ciclo Básico, or about the availability of qualified professionals to fill the roles of university instructors and advisors. Because of this relative lack of attention, updated and accurate information about the conditions of schools, educators, and students in Ciclo Básico, or about the availability of qualified professionals to fill the roles of university instructors and advisors, was not available when the program was envisioned. Lack of updated and accurate information meant that some assumptions that informed the original design of Éxito Escolar were incorrect. FHI360 had to make important adjustments to the original plans, and those proved to be time-consuming and delayed the implementation process.

> *"Initially they had talked about 'diplomado', however, as the teachers were consulted … they realized that it is not a "diplomado" what they want but it is a "profesorado" with a specialization. Then, the status rises, the expectations rise …"*
>
> *-MINEDUC staff*

Administrative processing and the need to coordinate multiple stakeholders have led to important implementation delays. There also have been administrative and logistical reasons for the delays. Some staff at MINEDUC commented that the processes (for example, procurement, hiring, signing contracts, etc.) took longer than they expected. According to one individual close to the program, part of the problem is that decision making depends on several isolated parts instead of being centralized, "*...the hiring processes were very slow and because there is not a single person who directs, but it often goes in cascade or is isolated, I think it is complex.*"

> *"They never explained to us (why the project was delayed). They simply told us that only at that time the project had been approved. It was mostly because of that, because the project had not been approved because there were many institutions behind it, right? Then one depends on the other and if the other does not agree ... that was the only thing they told us"*
>
> *-University instructor from Solola*

Implementation of the program has been further complicated because multiple entities are involved and their activities need to be coordinated. According to one individual at MINEDUC, at the beginning there was a problem with ownership, "*…everyone said, this is not mine, this is something very big, I better give it to you, this is your responsibility.*" This process of "handing off" to other individuals furthered slowed the implementation processes. More recently, an increasing number of stakeholders have taken interest in the program and pulled implementers in many different directions, making it difficult to move ahead in one steady direction. One stakeholder noted "*DIGEDUCA said one thing, DIGECADE said something else, and the "despacho" was not in tune with the direction or with PRONACOM, MATHEMATICA, MCC.*" Even though the board led by the vice-minister appears

to be playing an important coordinating role, a MINEDUC staff member noted that decisions made by the board are not always shared efficiently with stakeholders at other levels of the system. Implementers might be unaware of changes or their rationale, which could lead to coordination issues and the potential for confusion.

The interviews that we conducted in Guatemala also highlighted a number of instances where there have been disagreements between the implementing organization and the universities. These disagreements involved discrepancies between what the implementing organization envisioned and what the universities are contractually required to complete. The interviews attribute these disagreements to communication failures that can be improved as the program moves ahead in the coming months. This vision is shared by at least one stakeholder closely involved with the program, who added that it would be important to have a person or organization that is able to facilitate the relationship between the program's designers and implementers and help them find common ground.

Working with universities with high levels of autonomy and different trajectories, working styles, and philosophies makes it difficult to uphold the program's standards and expectations. The three universities delivering the PADEP/CB are private universities. InterNaciones University was established in 2009 and Panamericana was established in 1999. In contrast, University del Valle de Guatemala was established in 1966 and has been functioning for over 50 years. The three universities are all independent from MINEDUC and are used to a high level of autonomy over their training programs. Moreover, universities were provided with the general academic plan for PADEP/CB, but according to university representatives themselves, they were given ample room to make modifications.

Staff at MINEDUC and an individual involved with the program's design said it has been difficult to change the mentality of the universities and to have them appreciate that PADEP/CB is not the same as other programs they offer to students. The MINEDUC staff also noted that the universities need to be responsive to the perspectives of the other stakeholders involved in Éxito Escolar. One staff member at MINEDUC said that a major risk to the program is that "*the universities are not clear, at a certain moment, that this is a special program, it is not a regular university program ... it is not a program as the ones they offer on a daily basis; instead, it is a special program that the universities have at this time and they do not understand its role and its importance.*" The same person noted that the universities are not used to being monitored and could feel threatened by the program's monitoring and support activities. According to this person, this has been one of the most difficult points in the process. Another individual at MINEDUC said that monitoring should be increased to ensure that universities are meeting the program's expectations.

From the universities' perspective, they were given general guidelines and were asked to develop the specifics themselves. The coordinator and instructors at each university made modifications that they considered necessary to improve the program. An instructor from Chiquimula commented, "*They only gave us the modules, that is, the topics ... So we adapted it to how we thought we would do a better job ... It was a challenge because they gave us the modules and they only told us to do the program but they did not provide anything else.*"

From one school year to the next, teachers who participate in PADEP/CB might teach a different subject, teach at a different school, or not teach at all. Staff at MINEDUC, teachers, school directors, and other stakeholders all said that teachers who are not part of the Ministry's roster, particularly teachers hired by the municipality and teachers who work at cooperatives, can be reassigned to teach a different subject or teach at a different school, or their contracts might not be renewed for the next school year. If trained teachers are unable to teach their subject of specialization, students will be affected insofar as teachers might not apply the same level of skill and competency to every subject. If, on the other hand, teachers are unable to continue teaching, then desired effects on students might not materialize at all, and teachers would be unable to hone the new skills they are learning. Finally, from the evaluation's perspective, if trained teachers are reassigned to a control school, the resulting contamination would attenuate the contrast between the treatment and control groups, making it more difficult to detect the true impacts of the program. In addition, if a high enough percentage of trained teachers are no longer in the school when endline outcomes are measured, we might be unable to measure the impact of the program on teachers' behaviors.

Facilitators of PADEP/CB's implementation

In deciding whether or not to adopt a new program such as PADEP/CB, educators reflect on whether the program responds to their needs, and whether it is well aligned with their beliefs, attitudes, and abilities (Aarons, Hurlburt, and Horwitz 2011). Educators' beliefs about the program's tangible and intangible benefits and, its relative advantages compared to other programs, and their assessment of their own ability to meet program requirements, are key predictors of whether a program is adopted (Dearing, 2009). Next, we describe some of the beliefs and attitudes that are likely to facilitate or hinder educators' completion of PADEP/CB and, ultimately, the improvement of educational quality in Ciclo Básico.

Ciclo Básico educators place a high value in becoming subject matter specialists, which serves as an incentive to participate in PADEP/CB. There are not enough teachers to meet the demand for Ciclo Básico and, among existing teachers, only a small proportion are subject matter specialists. Baseline data from the impact evaluation show that fewer than two percent of teachers have a specialization in languages and literature, fewer than three percent have a specialization in natural sciences, and fewer than five percent have a specialization in math. The lack of subject matter specialists, and the fact that there are too few teachers in Ciclo Básico in general, means that teachers are often required to teach multiple subjects that they lack knowledge on, or for which they might have different levels of aptitude. PADEP/CB instructors, school directors, and teachers consider lack of specialization a main contributor to low quality education and poor student outcomes in Ciclo Básico. One of Éxito Escolar's core objectives is to develop educators' competencies in key content areas and methodologies. To fulfill this objective, PADEP/CB offers educators the opportunity to become specialists in one of four key areas (namely,

> *"Interviewer: But how do economic conditions improve if I obtain more titles?*
>
> *Teacher: Because one can have a better job. For example, we make one thousand five hundred quetzales and if one is more prepared, eeh, I was listening to some comments on Saturday at university, that there are some who have the possibility of making eleven thousand, ten thousand quetzales"*
>
> *-Teacher from Chiquimula*

leadership and management, mathematics, natural sciences, and language and communication). Becoming a specialist is a key motivating factor for educators to participate in the program. A teacher from Chiquimula noted, "*What I see as beneficial is that it is a specialization ... it is where the education system is going, where each teacher is working in the area in which he has specialized.*" Educators believe that, in addition to improving their skills and knowledge, specializing is important for job security and to gain access to better job opportunities. As a teacher from Solola noted, "*Training, knowledge, and in a way also guaranteeing the job ... as long as one has more titles, one can have better job opportunities in any school.*" If the program is successful, student outcomes are expected to improve in the subjects that teachers are becoming specialists in, even if the teacher shortage keeps requiring educators to teach outside their area of expertise.

The PADEP/CB "scholarship"[32] is seen by teachers as an opportunity that cannot be wasted. Educators said that the costs of pursuing a specialization degree at a university are often prohibitive. Even though PADEP/CB participants incur some cost associated with the program (for example, the cost of transportation, Internet, and alimentation), the fact that teachers do not have to pay for the program is seen as an advantage compared to other programs. A teacher from Chiquimula noted, "*To pursue a specialization in another university is not, eeh, an easy thing in terms of the financials. And we are offered a scholarship, the truth is that it would be a waste to say no.*" This cost advantage is expected to increase the likelihood that educators will complete the program (Dearing 2009).

The methodologies taught in PADEP/CB are considered more effective than "traditional" methodologies, which could help keep educators engaged in the program. Educators remarked that the pedagogical methodologies taught in the program are an improvement over the "traditional" teaching methods typically used in the classroom. University instructors said that their lessons are designed to demonstrate how teachers can use innovative techniques to make the content more accessible and appealing to students. These efforts appear to have been fruitful, as most educators consider the methods they are learning to be an improvement over practices that are less dynamic and engaging. In the words of a teacher from Chiquimula "*It is no longer intended that the student only memorizes, that the teacher is the one who knows everything, but now both the student and the teacher learn from each other. And what we are looking for is for the student to look for solutions to problems or situations that can occur in life, not only to come to memorize a concept of a, a book, but to leave prepared for what comes next.*" Educators' conviction that the program will lead to positive changes in their own behavior and in their students' learning outcomes should give them an incentive for completing the program (Han and Weiss 2005).

"They already realized that the student does participate; we are the ones who many times do not use the mechanisms for them to do it"

-School Director from Solola

Educators believe that what they are learning and doing in PADEP/CB can be readily applied in the school and classroom. A program's simplicity and

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[32] Scholarship refers to the fact that educators were offered the opportunity to participate in the program without incurring any registration fees. Teachers and school directors do not receive any compensation from the program, or stipends to cover costs associated with the program.

responsiveness to participants' needs are key predictors of whether and how widely it is adopted (Dearing 2009). University professors said they make deliberate efforts to demonstrate techniques and assign homework that educators can use in their practice. An instructor from Chiquimula said, "*In other places they ask students for a lot of work, we do not; we do more successful learning activities, (we think about) how the activities can be useful in their practice and how we can improve teaching practices. So we have focused on that, instead of doing murals or something like that, we have always tried to focus activities on improving their practice in the classroom.*" Many school directors and teachers reported that they are already applying what they are learning in their schools and classrooms. Educators credited the program's applied approach with giving it an advantage over programs that tend to be more theoretical. A school director from Jalapa remarked, "*What has worked really well has been ... maybe that, the same assignment that we need to present at the university, is applicable in the institution ... I was asked for my improvement plan, but they told me to adapt it to my institution, and I developed it thinking about my institution, I presented it, I earned my points, but now I am applying it here, so I think that has been, maybe the best.*"

Barriers to the implementation of PADEP/CB

Despite educators' positive beliefs and attitudes about the program, there are other less positive beliefs or attitudes that could hinder the program's achievement of its goals, along with capacity and structural issues.

Many teachers participating in PADEP/CB lack foundational knowledge in their chosen area of specialization. The PADEP/CB diagnostic tests administered by FHI360 revealed that too many teachers do not have mastery of the content they are expected to teach. The average teacher enrolled in the program answered less than half of the questions in the exam correctly: 35 percent of math questions, 44 percent of communication questions, and 43 percent of natural sciences questions (FHI360 2019). Because PADEP/CB is an in-service teacher training program, and teachers were presumably teaching the subjects they were going to specialize in, university instructors assumed that the main focus was to improve teachers' pedagogical methodologies, not their content knowledge. Once the program started, instructors were surprised to learn that many teachers lacked the foundational knowledge required to teach the subjects. An instructor from Chiquimula noted, "*To be honest ... I planned my class for students who knew math. Because yes, we had been told that they were teachers who were already working in the area of mathematics. So, if someone tells you they are already working in teaching mathematics ... I thought they had the knowledge. But, no, when I arrived at the class and started to teach, uh, no, they did not understand.*" At the time of the diagnostic test, about two-thirds (66 percent) of teachers were teaching the subject they chose to specialize in, but one third were teaching different subjects (FHI360 2019). This subject mismatch for a non-trivial proportion of teachers does not appear to fully account for the overall low results in the exam. Both instructors and other stakeholders are concerned that even though the program will likely equip teachers with innovative teaching techniques, it will probably not compensate for teachers' knowledge gaps. FHI360 intended for the program to improve both teachers' knowledge and instructional practices; however, it is unclear if the universities have bought into this approach and how successfully the program can simultaneously achieve those two ambitious goals. Unless

the program is extended to address this issue, university instructors were skeptical that the overarching goal of improving the quality of Ciclo Básico could be achieved.

Some of the instructors hired to deliver the program are not content experts. FHI360 and MINEDUC envisioned that the universities would hire the best instructors to deliver the program. However, instructors do not always have the required qualifications and do not meet stakeholders' expectations. A stakeholder close to the program explained that it is difficult to find qualified instructors to teach in remote locations. According to the same person, this limitation is more pronounced in mathematics than in the other three subjects. Another stakeholder close to the program said, "*The universities do not have specialized personnel; that is, they are teaching the profesorado in mathematics and they do not have math teachers, they are offering language and communication and they do not have teachers specialized in language and*

> *"…One of the great challenges is that we are reaching very distant municipalities, and it is very difficult, especially for mathematics, to find people or trainers of trainers -the university instructors who are giving classes to the school teachers who are being trained- who are really specialists. We have talked a lot with the universities and it has been a subject of much controversy, much discussion ... because although it is true the experience at the level is fundamental, eh it is also important that they possess the competences or the mastery of the content"*
>
> *-MINEDUC staff*

> *"We had the opportunity last year, before the first cycle (of PADEP/CB) started, to have a training in Guatemala, at the Ministry of Education, and there were instructors from the other two universities. When they separated us by specialties they showed me that they did not have much knowledge of mathematics"*
>
> *-University Instructor*

communication." Instructors' lack of expertise has been noticed by school directors also. A school director from Jalapa said that an instructor who taught a course on the use of technology in the first cycle, was teaching mathematics in the second cycle. The instructor was well versed in technology but struggled with math. A school director from Alta Verapaz noted that one instructor is teaching three courses because the university does not have more personnel. The perceived low quality (or lack of qualifications) of some instructors has already led to teachers dropping out of the program (nearly 12% have dropped out for this and other reasons) and could undermine other efforts to sustain educators' engagement. A teacher from Jalapa reported, *"I signed up, I went to two sessions; I saw it was so easy and, and, such an easy thing, that the instructors arrive there to play, to sing, to applaud, to have people come to the center of the room, and nothing about content, so I did not like it. I had, I had included myself there but as I saw the low quality, very low quality from my perspective, I said I will drop out, I dropped out.*"

Some teachers might not be motivated to learn, but they are participating in the program to get financial benefits. Facilitating participation in professional development programs often takes on many forms. Although stakeholders, donors, and implementers hope that participants and beneficiaries will be intrinsically motivated to change their behavior, economic incentives are often at the heart of people's willingness to participate in programs. The potential for economic gains, including improved job conditions and opportunities, stands out as a key motivating factor for teachers and school directors to complete the

> *"(…) the lack of interest of some, that is, they arrive and, and bah …. I do not know, they arrive, they arrive … they show up but sometimes they are not motivated to learn"*
>
> *-University Instructor from Chiquimula*

PADEP/CB. Even though this is not a problem per se, university instructors and other stakeholders close to the program believe that potential financial gains are the sole reason why some educators attend the program. According to some instructors, teachers show up because they think they have no other choice if they want to obtain a bonus or promotion, but not because they want to learn. Although some educators were emphatic that PADEP/CB did not promise economic incentives, other educators and instructors asserted that there were rumors or promises of a bonus for participating in the program. One instructor from Alta Verapaz remarked, "*That forces them, even if they are not willing to study, because if at this point they have not sought their academic improvement, is because they have no interest. Ah, but there is going to be an economic bonus, so then I have to go because I do not have any other option, otherwise I will not get it(the bonus)"* One stakeholder close to the program commented: "*The teachers in service, are not motivated for this ("profesorado") eh, to tell you something, the teachers who are in the PADEP for primary, they receive a bonus to graduate, not these, therefore they prefer to go to "profesorado" for primary rather than to this one.*" If some teachers lack motivation to learn, they could meet the requirements of the program but not make the extra effort to effect actual change in their instructional practices. According to some instructors, teacher motivation has improved over the initial six months of the program. The instructors noted that educators ask more questions during class and appear more interested in the content. Other instructors believe that lack of interest continues to be a major challenge to the program's success. In addition to limiting the potential impact of the program on teachers' behavior, real or perceived lack of interest from teachers can undermine university instructors' motivation to teach.

Educators' competing responsibilities are a major barrier to participating in PADEP/CB. The two-year PADEP/CB requires 643 to 716 hours of in-person training and 785 to 875 hours of online training. Educators are expected to attend in-person classes every Saturday at one of 16 training sites, and to complete homework assignments whose level of effort varies depending on the instructors. They are also required to participate once or twice a week in learning communities organized at the district level, and to complete daily assignments for the online component. Most school directors and teachers described the adjustments and sacrifices they or their peers have made to meet program requirements. A school director from Solola commented that, *"If before they went to bed at 10:00, now they go to bed at 12, 12:30 to fulfill their responsibilities, to not let down the school and to respond to the responsibilities with the university.*" A few educators who participated in the focus groups said they were unable or unwilling to make such adjustments, and chose not to participate or to drop out. Overall,

educators perceive the program as taxing because of their competing professional and personal responsibilities. Some university instructors are sensitive to these challenges and have reduced homework assignments to minimize the burden on educators. A few instructors, however, compare the program to their own professional training and believe it is not demanding or strict enough.

Time requirements and competing responsibilities might pose a bigger barrier to educators' participation in the online component. The time required participants in the program (between 1400 and 1600 hours in 19 months) presents a major challenge to successful implementation. The hours include participation in workshops, online training, and even daily assignments. A teacher from Jalapa shared that he only has time to work on the online course in the evenings, after working the morning shift at the school and a second job in the afternoon. This teacher, along with many others, is finding it difficult to manage the workload, *"… Sometimes just to do a task you need three hours, because you have to read, you have to see a video, and then you can do your work. Sometimes they ask for conceptual maps, sometimes they ask for comparative tables ... you have to do a daily task, which means that you spend every day on the platform; that is taking a toll on us."*

> *"… Technology scares me and even seeing the guide with the curriculum, which has some aspects of technology, makes me say: yes, today I will quit this, I will run from this. No! My husband tells me, why are you going to quit if you can do it? So, technology is a challenge for me"*
>
> *-Teacher from Jalapa*

The online component itself has been another important challenge for educators. In addition to material and structural barriers, educators' perception of how easy it is to use the online tools, and their assessment of their own ability to use technology and acquire new technological skills (self-efficacy), are good predictors of their engagement with the online resources. Unfortunately, educators have faced myriad challenges with the online component, including a general lack of familiarity with technology, lack of equipment or inadequate equipment, Internet costs, workload, and a feeling that there has not been enough support from the program to overcome these challenges.

A teacher from Chiquimula said, *"Most of us do not have residential Internet... And for the online courses, most of us buy megas, just for that purpose, right? Therefore this generates, generates [expenses]."* A few educators and instructors asserted that difficulties with this component have led teachers to drop out of the program. A teacher from Sacatepéquez commented that *"Because they did not understand the platform; they decided to drop out because it was really hard for them."* Also referring to the online component, an instructor from Alta Verapaz said that, *"Even last year, it seems that not everyone managed to access [the platform]. They were annoyed; I think it has been the most pronounced inconformity felt among the ones that I work with."* One of the teachers who is attending the in-person classes said he had not used the online component at the time of the focus group.

Some PADEP/CB instructors and staff from MINEDUC empathize with the educators and appreciate the challenges they face. One instructor from Sololá suggested that educators could benefit from extra courses to familiarize themselves with technology, *"Some extra courses so that they can learn how to use of computer, many of them cannot use the computer yet, so when I*

have the e-learning module for example, it is difficult for them to connect because they do not know the technology. They are teachers, maybe they have experience in knowledge of their area, but in technology they, because some of them are old age, others are young but in their communities they do not have this technology; they have a hard time." An instructor from Chiquimula said that educators do not have convenient access to Internet service or a computer in their communities. This instructor has allowed educators to use his Internet to upload homework or to do research for class assignments.

Even though these barriers are legitimate, and are acknowledged by the designers of the program and some staff at MINEDUC, some instructors attribute the difficulties to educators' lack of motivation and will. One instructor from Chiquimula stated: "*The platform of the university is a valuable resource and unfortunately many teachers have not wanted to accept it out of reluctance, because they have placed that obstacle; then some dropped out for that reason ... we consider that all, all the teachers have a smart phone, all have Internet, but to do homework they did not have them; to sign in and upload a file or send a photo or answer some questions, they did not have Internet. Then, that's where I say it is about their interest on their own knowledge, right? ... It is not because the platform is difficult to use, but rather that the teachers themselves have been reluctant.*" Regardless of whether their perceptions are accurate or not, these instructors might be less inclined to offer help to educators who may need it.

> *"I even learned a little bit in "Duolingo" to be able to teach the students"*
>
> *-Teacher from Chiquimula*

Despite these challenges, some educators are beginning to gain familiarity with the platform and to appreciate the value of technology in helping them to connect with their students and enhance their teaching practices. One teacher from Jalapa commented, "*I did not even know Google tools, I am embarrassed, I had never used Google tools with educational purposes, and they are wonderful.*"

Learning communities

Learning communities are organized at the district level by areas of specialization. Educators are expected to meet once a week to brainstorm solutions to the problems they encounter when implementing what they are learning in PADEP/CB in their school and classroom, and to develop effective ways to present the content to their students. Learning communities use an approach that involves "research, action, and reflection" and are led by educators themselves, with support from pedagogical advisors.

School directors and teachers see learning communities as a positive, differentiating feature of PADEP/CB. School directors and teachers consistently noted that learning communities are enriching socialization experiences. Both groups of stakeholders noted that they value the opportunity to share perspectives and teaching resources (for example, textbooks and guidebooks) with their peers, and to collaborate to solve real problems. One teacher from Sacatepéquez, who had participated in other university trainings, asserted that "*There [in PADEP/CB], what has made the difference are the learning communities.*"

> *"We have even shared materials, in fact ... For example, on Saturday they are going to share the, the natural science book for eight grade that we did not have, we have been working with photocopies, then, a colleague that has it, will share it and will bring it to the instructor"*
>
> *-Teacher from Chiquimula*

However, learning communities demand more time and transportation costs money, so educators would likely not participate if learning communities were not a program requirement. Distance, time, and the costs involved are major obstacles to educators' participation in learning communities. A school director from Alta Verapaz said that he travels an hour and a half by motorcycle to attend the learning community meetings. A teacher from Jalapa said, *"We had been told that it [the learning community] had to be in the afternoon, so we had to come to work here [at the school] and meet in the afternoon; (sigh) I was discouraged."*

> *"Initially we were in an impasse because the intention was that we'd used additional time [for the learning communities]. So we had to use other time besides Saturday, and that's why last year ... we did not have any meetings. Only this year it was implemented ... within the course schedule."*
>
> *-Teacher from Chiquimula*

One school director from Sololá commented that the program would be improved if "*the meetings of the communities were within the class activities.*" A stakeholder close to the program, when discussing barriers that the program has faced, commented that, "*There is an economic barrier also on the part of teachers; for example, if you have a family and work in a small town, but the headquarters is in another municipality, it involves traveling to this municipality. It doesn't matter that it is 25 quetzales for lunch, they think about all that; it will be 50 quetzales a week.*" This was also brought up by a representative from MINEDUC, who commented that teachers receive little compensation and often need to work multiple shifts or hold multiple jobs to make ends meet. This makes it challenging for educators to attend learning community meetings outside of working hours, in addition to attending the classes on Saturday.

> *"It's not that I do not want to do it, it's that I cannot, I do not have time to allocate one morning or one afternoon, because I have another work shift to attend in order to survive. But the strategy per se, I think is a very good methodological strategy, very positive."*
>
> *-MINEDUC staff*

Perhaps for these reasons, participation in learning communities varies across the schools in the study. Some educators reported meeting every two weeks, while others reported meeting on a weekly basis. Some educators have agreed to meet on Saturdays, during or after PADEP, to minimize the costs. When asked if they would continue to participate once the program ends, a group of educators from Chiquimula did not hesitate to say that they "*would not do it; it would be impossible.*"

Pedagogical support

The pedagogical support component builds on a model that MINEDUC has used with *escuelas normales* (teacher schools in English) since 2013, as well as in pre-primary and primary school. Pedagogical advisors are expected to support educators in implementing what they are learning in the PADEP/CB. For this purpose, they observe teachers' lessons and offer constructive feedback about their pedagogical practices. They do not have "administrative authority" over teachers and are not expected to monitor attendance, whether the teachers arrive on time, or other aspects of compliance. The advisors are central to the program's success because they reinforce what educators are learning in PADEP/CB and contribute to the ultimate goal of improving the quality of instruction in Ciclo Básico (MINEDUC staff).

Educators and university instructors are generally not aware of the goals of the pedagogical support component. At the time of data collection (about six months into the program), most teachers had received only one or two visits from a pedagogical advisor, and some reported not having received a single visit. The sessions consisted of a classroom observation, and some, but not all educators reported receiving feedback. A few teachers indicated that they were not observed but were asked some questions, which may have

> *"They came once, now they are coming tomorrow, it is second time; and they come just to observe and (respondent laughs) make you feel bad and make me nervous"*
>
> *-Teacher from Chiquimula*

been part of "social capital study" or "social actors mapping" done by FHI360. One of the university instructors said that lack of communication has led to confusion about the role of pedagogical advisors. Implementing staff said that instructors have expressed feeling "invaded" by the assessors, which also appears to stem from the fact that they are not aware of the intended role of the assessor and feel evaluated. The effectiveness of PADEP/CB will likely be strengthened if the role of the pedagogical advisors was made clearer to the university instructors who could leverage it to achieve training goals, and to teachers who could use advisors as a resource to fill methodological or content gaps.

Some pedagogical/management advisors do not have the optimal qualifications to fulfill their role. Pedagogical advisors are expected to support educators in improving their instructional practices by observing educators' lessons and offering formative feedback. However, one university instructor commented that, *"There are already some disagreements among teachers because they were selecting people who do not have the capacity to be pedagogical advisors. So I can say with all sincerity that the political issue is one of the*

> *"It has been difficult for FHI, I think… to find, at the beginning, people with the ideal qualifications we were all looking for"*
>
> *-MINEDUC staff*

strongest threats. First because the processes are truncated; second, because it leads to people who are incapable and incompetent in key positions." FHI360 is developing materials to nurture the skills that advisors need to provide effective support to school directors and teachers, but it is acknowledged that it is a challenge and a work in progress.

Pedagogic support staff need additional training on how to provide constructive feedback to teachers. At least two teachers who participated in the qualitative component of this study said that they received decontextualized feedback from the pedagogical advisor. When feedback is taken out of the context in which the teacher used a particular behavior, recipients of the information can take the feedback as a general criticism and not as a situation-specific suggestion. Pedagogic advisors need to learn to ground their feedback in situations, which removes the personal nature of the feedback. It is important to note that these may be two isolated incidents. However, sensitivity and responsiveness to the particular conditions of educators in the program is an important aspect to emphasize as advisors are trained. One teacher from Chiquimula commented that the pedagogical advisor, *"[he told me] that I should not have them all together, that I should divide them, on one side I put one grade and on the other side, I put the other grade… because I had them all together … I told him it was how I can be with everyone, right? Because I cannot go to one side, leave the other, and like that. And I feel that for me it's easier to work like that, but he asked me to move them, to separate them.*" Many teachers are specializing in a subject that they do not teach (or are in the leadership specialization but are not school directors), so pedagogical advisors could be observing them in a context where they might not be able to apply what they are learning in PADEP/CB at this time. Advisors need to be prepared to offer relevant support in that context.

> *"And it's not to discriminate or anything, right, but, uh, apparently, she's a primary school teacher, uh, she worked in a private school…where things are easier, right? So, it's not the same to be with the group and you have to run from one extreme to the next and change periods, than being in one place with all the human resources."*
>
> *-Teacher from Chiquimula*

Parent organizations

Parent organizations already existed in the five departments before the start of Éxito Escolar. They are mostly administrative in nature, managing financial resources provided by MINEDUC. As part of Éxito Escolar, the pedagogical and management advisors are supporting these organizations and shifting their focus to include features such as supporting children in school, raising awareness about risks of school dropout, and encouraging frequent review of their children's grades as ways to establish an early warning system.

Parent involvement in school has often been limited to obtaining resources from MINEDUC. When asked about parent involvement, stakeholders mentioned parent organizations, assemblies, parent committees, and parent councils. Educators had difficulties articulating the difference between these groups. Few parents reported that their school had a functioning parent organization. Parental involvement is often limited to channeling financial support from MINEDUC and the departmental directorates (although a few educators said that parents sometimes support sports and cultural activities). Schools are required to have a formal parent organization to receive resources from MINEDUC, through established support programs (in Spanish Programas de Apoyo a la Educación) such as the *programa de gratuidad*, which provides Ciclo Básico schools with 100.00 quetzales per student, to cover the costs of minor

> *"Where that [parent] organization is most needed is for receiving free funds (fondo de gratuidad, in Spanish), and other resources"*
>
> *-School director, Solola*

renovations and didactic materials. One staff at MINEDUC commented that parent involvement decreases as students move from primary school to Ciclo Básico. She attributes this, in part, to the fact that some of the support programs that are available for primary schools are not offered in Ciclo Básico (*refracción escolar* and funds to purchase materials), so parents have fewer incentives to participate.

The requirements to become a board member are an obstacle and disincentive to parent participation. The board of directors is responsible for administering the school's financial resources and is accountable for the use of funds received from support programs. Board members are legally required to be literate and are unofficially expected to invest time and resources to carry out their functions. These requirements discourage participation and pose barriers to forming parent organizations in some communities where adult illiteracy is common and where parents might lack economic resources to share with the organization. A teacher from Chiquimula stated, "*Now they are motivated to collaborate ... but, what can I say, no, they do not always do it because they do not have the money. If they want to go out and leave applications, they need to have money.*" Some educators indicated that it is difficult to find parents who are willing to participate and also know how to read and write. For example, one teacher from Chiquimula said that the organization, "*was not set up before because parents cannot read or write and within this organization the requirement is to know how to read and write. Thank God, we already found those three and that's why we managed to do it.*" In addition, some parents were discouraged from participation when they heard about the level of involvement and responsibility expected from these organizations, combined with little support from MINEDUC to exercise those functions.

> *"The president [of the parent organization] had to go to the financial institution to open the account with his own resources…It is a moral obligation to sponsor this parent who loses his/her day, eh, support transportation costs and help them because they do not know, so we have to carry them"*
>
> *-School director, Chiquimula*

Engaging parents to support students' transition to and completion of Ciclo Básico will likely require a major shift in parents' current role and beliefs, which may be a lengthy process. Educators believe that parents have a central role to play in supporting their children's educational attainment, but parents are not fulfilling that role. According to program designers as well as school directors and teachers, many parents believe it is not necessary for youth to continue their studies after primary school or after Ciclo Básico. Raising awareness about the importance of Ciclo Básico will be essential to gaining parents' support in achieving the goals of the program. In some areas, circumstances that the program is not designed to address will likely continue to make it difficult for families to get involved in youths' education and to support students' education attainment. Such circumstances include high levels of migration, single-parent families, youth who live with relatives, and economic hardships that require caregivers to work multiple jobs and youth to be in charge of domestic work and to work outside the home.

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IX. INSTITUTIONAL CAPACITY STRENGTHENING (IPC)

Activity 3 (IPC) of the GEP focuses on improving MINEDUC's institutional capacity to plan and budget so that it can provide an equitable and high quality secondary education (MCC 2016). It complements Éxito Escolar (Activity 1) in that it provides technical assistance to MINEDUC to facilitate the use of data for decision-making and seeks to establish national systems that improve the selection of secondary education teachers as well as increasing the budget for secondary education. The activity is comprised of three main components, which are referred to as the change strategies in the remainder of the document.

Use of service standards for planning and budgeting. This activity provides support to MINEDUC to develop and use service-standards as a mechanism for improving how staff plan and budget for secondary education. The component includes: developing a plan for collecting and analyzing data from secondary education establishments; an implementation plan for the development of statistical information systems, teacher demand models and computer module for estimating the educational population; and the development of an annual education statistics handbook. As part of the development of this activity, FHI360 staff will undertake an analysis that identifies the key inputs for Ciclo Básico[33]; design and implement a reporting system for planning and monitoring the application of the standards and performance[34] and develop a multiyear expansion plan based on the new standards and evidence-based estimates of demand.[35,36] In addition, the GEP will develop and implement a communication and advocacy plan to sensitize stakeholders and decision makers to the fiscal/budgetary needs for enhancing quality and equitably expanding the provision of Ciclo Básico.

Teacher recruitment and selection. This activity focuses on developing new protocols that are consistent with the needs for implementing the Curriculo Nacional Básico (CNB) and improve the efficiency and equity of teacher deployment.[37] In addition to the new recruitment/selection protocols the activity includes the development of a manual for implementing the system and a catalogue of job postings. FHI360 also plans to develop an information and management system for teacher recruitment, but they are waiting for Ministerial approval to move forward.

Information systems for decision-making. This activity focuses on strengthening the decision support systems and technical capacity necessary for implementing the standards based planning model. These investments include the development (or improvement) of information systems and planning methods for infrastructure, teacher deployment, and providing education (teaching and learning) resources. For each of these new or enhanced systems, the GEP will invest in the necessary training and capacity development of professionals to manage the systems

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[33] Sub activity: Report on Effectiveness and Efficiency of Ciclo Básico

[34] Sub activity: Annual Report on Ciclo Básico Performance

[35] Estimates based on demographic and geo spatial analysis.

[36] Sub activity: Multiyear expansion plan

[37] Proposal for teacher recruitment protocols

and utilize them for improved decision making. Products to be developed under this component includes: an infrastructure management system, educational resource database, teacher and education demand database, and a teacher registration and monitoring system.

FHI360 is currently developing and implementing these activities in partnership with MINEDUC. Section V of the Mathematica evaluation report (Felix et al. 2017) details the proposed design for the performance evaluation of IPC. The objectives of the implementation study are to evaluate the project's effectiveness and efficiency in delivering the planned activities and to generate lessons learned regarding project strategies and operational decision making and their effect on improving MINEDUC's institutional capacity (MCC 2016). Section A begins with an overview of the literature on institutional change and the components that often comprise education reform. Subsection B presents a summary of our design and the evaluation questions for IPC. Section C discusses our methodology and Section D presents findings from the first round of interviews with key stakeholders in Guatemala.

A. IPC Theory of Change

The IPC activity of GEP is comprised of 12 sub activities. While each sub activity is associated with a discrete deliverable product, none of the activities or deliverables by themselves is expected to have an impact on the IPC objective, "**strengthening the institutional capacity of MINEDUC to optimize planning and budgeting for the equitable provision of a quality Ciclo Básico.**" However, collectively, we expect to see changes within the institutions over time that lead to increased funding (and/or more cost-effective funding) for secondary education.

Our detailed TOC for the IPC activity serves as the basis for documenting the current state of MINEDUC's system and then documenting change over time. The ToC draws on the GEP logic model presented in Chapter I and adds additional details based on our review of documents and interviews with key stakeholders. Figure IX.1 presents the detailed IPC TOC.

Figure IX.1. IPC TOC
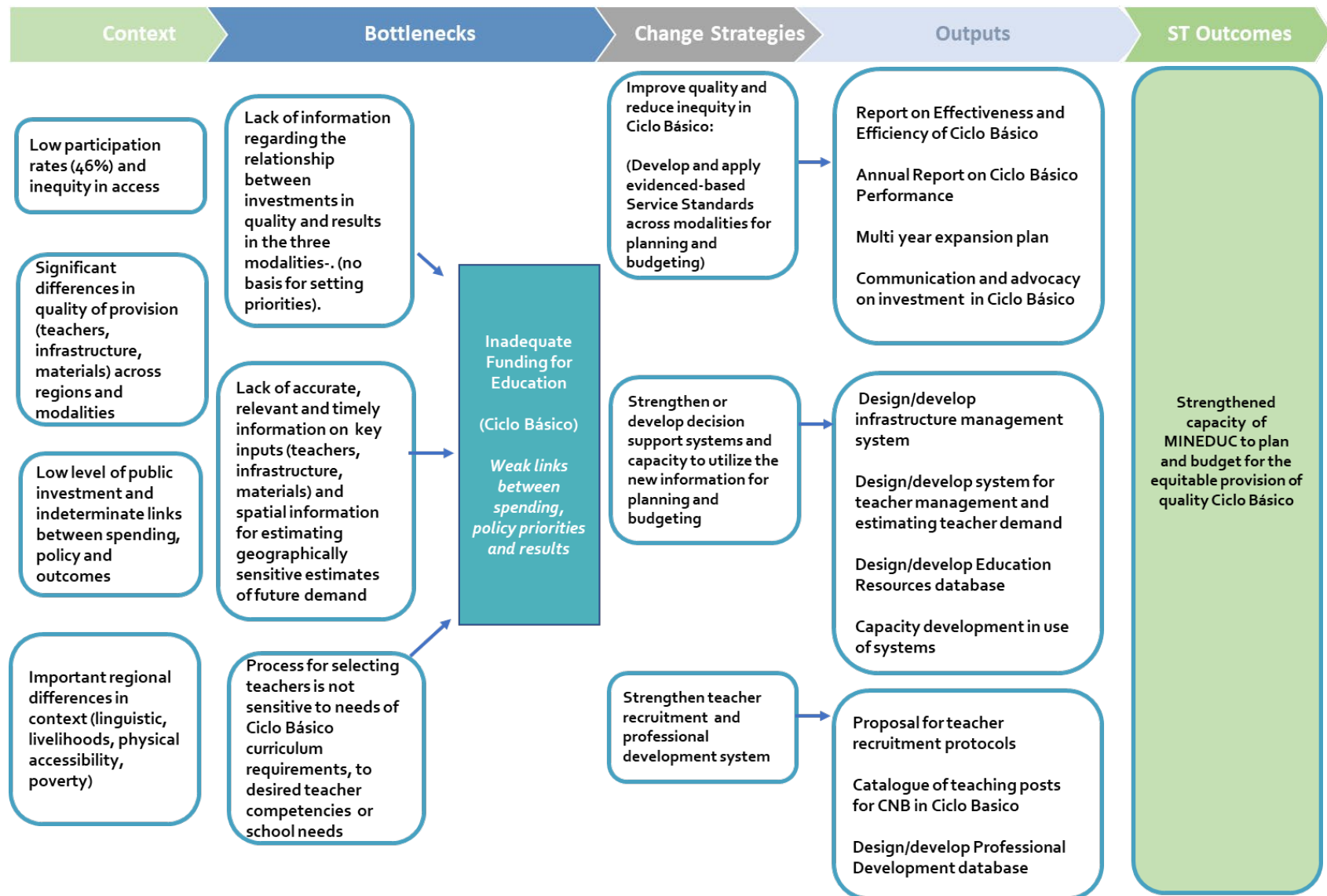
B. IPC Evaluation Design

IPC comprises an interrelated set of activities intended to strengthen MINEDUC's institutional capacity to provide high quality and equitable lower-secondary education (MCC 2016), including support to the broader institutional strengthening process envisioned in the Plan for the Transformation of Secondary Education. Our performance evaluation assesses the overall implementation and performance of the IPC activities in strengthening MINEDUC's capacity to improve effectiveness, efficiency, and equity (including gender, ethnic, and socioeconomic concerns) in lower-secondary education.

To understand the contributions of IPC to changes in the system, we employ a Drivers of Change (DOC) framework to assess how project design and implementation decisions address contextual factors that may affect the achievement of project goals. The DoC framework was developed by DFiD to assess a country's political framework and its relationship to donor support. We describe the DoC framework later in this section. Table VIII.1 summarizes the research questions, research dimensions, and data sources.

Table IX.1. Research questions, research dimensions, and data sources for Activity 3

Research questions
1.   Were the IPC activities implemented as planned (if not, why)?
2.   Were the IPC activities as implemented consistent with the objectives of the GEP and Activity 3?
3.   What factors contributed to or constrained translation of the investment in activities into improved quality, efficiency, and equity in the provision of lower-secondary education?

Drivers of Change Framework
•   Structural features (political, demographic, and macroeconomic contexts)
•   Institutions (legal, policy, and administrative practices)
•   Agents (individual and organizational interests or incentives and capacity)

Data sources
•   EMIS[a] data
•   Other administrative data
•   Budget documents
•   Key informant interviews (national and in sample of departments/districts/schools)

[a]EMIS = Education Management Information System

The evaluation uses a mixed-methods approach to conduct the performance evaluation comprised of two main components. The first component is a **qualitative implementation study** that draws on multiple rounds of key informant interviews with national and departmental staff and FHI360 staff to gather information that allows us to employ the DoC framework during analysis. The qualitative interviews will be complemented by a series of Delphi surveys to systematically gather and consolidate opinions about the system over time. The Delphi technique (described below) uses a series of surveys to reach consensus on themes and topics that influence policy making. The second component is a **trend analysis** that uses secondary data to examine changes over time in key outcomes related to the IPC activity (e.g., changes in budget allocations to secondary education; changes in teacher hiring and retention data). We will draw on national budget and administrative data from all departments in Guatemala (Activity 3 is national in

scope) as well as project monitoring data from the MCC monitoring and evaluation (M&E) plan. Below, we describe the status of IPC data collection efforts.

Qualitative implementation study

The implementation study will draw on two rounds of focus groups with school directors, teachers, and parents, and two rounds of interviews with other key stakeholders such as members of the teacher's union, Departmental education staff, human resources, budgeting and planning, and the implementing organization. The first round of interviews (completed in 2018) captured information about the current status of the system (from an institutional perspective) and perceptions of the teacher hiring and recruitment strategy, budget allocations for secondary education, and secondary education system needs. Additional rounds of data collection will capture longer-term results and help guide the trend analysis. Protocols for interviews with key high level stakeholders will be developed in accordance with the list of stakeholders provided in the evaluation design report (Mathematica, 2018). We will include additional questions for school directors, teachers, and parents about the secondary education system's institutional framework and capacity as part of our implementation study for *Éxito Escolar* as a cost-saving measure.

Delphi Technique

The Delphi technique is a systematic interactive way of reaching consensus by gathering expert opinions and perspectives from a panel of participants over 2 or more rounds of engagement. Surveys are sent to a designated panel of experts who independently assess the importance of a theme or topic. The facilitator then reviews all the responses and summarizes the data, consolidating responses where consensus is reached. The summaries are returned to the panel of experts who again comment on the summaries. The process continues until consensus on the theme is reached. The number of rounds is determined by how quickly the stakeholders are able to reach consensus on a theme or topic. It is a type of consensus method which does not require face to face meetings. A modified Delphi exercise will be utilized to capture the consensus of key stakeholders regarding progress in the key change strategies of the IPC activity. The evaluators will use the key informant interviews captured during the mission to identify a relevant expert panel (5-6 persons) for each of the change strategies and develop the content for a short survey instrument. It is anticipated that the short survey instruments utilized for the Delphi exercise throughout the evaluation will include primarily multiple choice questions using a Likert type scale. As per the Delphi method, an initial survey will be shortly followed by a second survey that enables the evaluators to identify consensus among the experts on key themes relevant to the evaluation. The Delphi exercise will be repeated periodically during the project period.

The application of the first series of Delphi surveys is planned for February/March 2019. We will create the survey online and send links to the key experts via email to gather their input into the study. Results for each change strategy will be analyzed and presented in the revised GEP Baseline Report that includes the Activity 1 qualitative interview results (anticipated May 2019).

Trends Analysis

The trend analysis will be completed at the end of the evaluation and will examine changes in key institutional outcomes over time. The analysis draws on secondary data sources and the MCC M&E monitoring indicators for the GEP project, including administrative data (for example, annual budgets, teacher databases, and student repetition, dropout, and completion rates) and documents that describe the budgeting process, teacher recruitment strategy, planned changes to the system, and completion of key deliverables. We will draw on other secondary data from MINEDUC's national databases, departmental offices, and FHI360. The key outcomes and data sources are summarized in Table IX.2 and discussed in detail in the evaluation design report.[38]

Table IX.2. Outcomes from secondary data

Research question	Outcomes	Source
1. Were activities implemented as planned (if not, why)?	• Increased quantity and quality of secondary education teachers • Improved retention and transition of secondary education students • Increased budget for secondary education	• FHI360 monitoring data • MINEDUC EMIS • Key informant interviews
2. Were activities as implemented consistent with the objectives of the GEP and Activity 3?	• New teacher hiring and recruitment strategy adopted by MINEDUC • Increased budget allocations for secondary education	• Key informant interviews • Focus groups • MINEDUC policy documents • Budgets
3. What factors contributed to or constrained translation of the investment in activities into improved quality, efficiency, and equity in the provision of lower-secondary education?	• Increased quantity and quality of secondary education teachers • Improved retention and transition of secondary education students • Increased budget for secondary education	• Key informant interviews • Focus groups • MINEDUC administrative data

C. Data Analysis Framework

At the baseline, to implement the DOC framework, we will identify the roles of Structural Features, Institutions and Agents in determining the effectiveness of planning and budgeting of Ciclo Básico. Subsequently, we will assess the activities implemented in the IPC with respect to their relevance, effectiveness, efficiency, impact and sustainability in addressing the constraints to planning and budgeting for the equitable provision of a quality Ciclo Básico.

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[38] A draft set of indicators and interim assessment will be prepared at the midline and shared with stakeholders in order to refine the methodology and measures for the final assessment.

Figure IX.2. Drivers of change framework
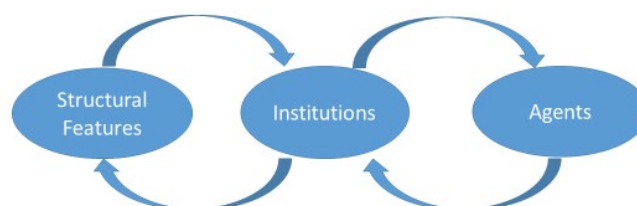
1. **Structural features.** The history of the government and MINEDUC, human resources, economic and social structures, demographic changes, regional issues, and external factors (such as global trends and trade). Examining project performance in addressing the structural context involves analyzing how the project addressed the political environment, demographic trends, and the macroeconomic context.

2. Institutions. The formal and informal rules of the game that influence the behavior of the agents in institutions. Among these are administrative and financial processes. Assessing project performance with respect to the institutional context examines how well the project considered formal and informal rules governing decision making, such as the legal framework, policy, administrative practices, and information management.

3. **Agents.** Organizations and individuals that pursue particular interests. Agents in the case of Guatemala would include staff in MINEDUC, school directors, teachers, and parents. Assessing project performance involves addressing the context and interests of important individual agents like officials at the various levels of system, from central MINEDUC to school-level managers.

D. RESULTS FROM ROUND 1

The first round of data collection took place in July and August 2018. Data collection included a first round of in-country interviews with key stakeholders and a review of documents provided to Mathematica by MINEDUC and the implementing organization. The interviews and document review allowed the team to understand the current status of implementation, details of expected deliverables, expectations for outcomes, and barriers and challenges facing the current system. The results of the initial interviews and document review are presented in the remaining sections. Table VIII.2 presents the organizations and positions who participated in the initial interviews conducted by our consultant, Mr. Anthony Dewees.

Table XI.3. Round 1 in-country interviews

Institution	Title or position of interviewee
MINEDUC	Vice-Minister for the Management of Education
MINEDUC	Assistant to the Technical Vice-Minister
MINEDUC	Director, DIGEACE
MINEDUC	Director, DIGEDUCA
MINEDUC	Director, Human Resources
PRONACOM	Director of Education
PRONACOM	Monitoring and Evaluation Specialist

Institution	Title or position of interviewee
Jurado Nacional de Oposicion	Director
MCC	Country Director
FHI360	Chief of party, Secondary education quality improvement program
FHI360	Institutional Strengthening Specialist
FHI360	ICT Specialist

In addition to the key informant interviews, the team also reviewed a series of key documents, including:

- *Propuesta de diseño, recolección, manejo y uso de datos de infraestructura para los establecimientos del nivel medio.* (Version II, with comments, October 10, 2017)

- *Plan de implementación para el desarrollo de los sistemas de información estadística y de demanda docente, modelo informático de estimación de la población educativa. Informe final.* (December 20, 2017)

- *Manual de reclutamiento y selección de docentes para Nivel Medio* (February 28, 2018)

- *Catálogo de puestos docentes: diagnóstico del catálogo, lineamientos para la alineación de puestos y requerimientos para la elaboración de herramienta informática. Informe final.* (December 20, 2017)

As emphasized above, most of the discrete activities and products implemented as part of the IPC contribute to three change strategies:

1. Develop and apply evidenced-based Service Standards across modalities of Ciclo Básico for planning and budgeting.

2. Strengthen or develop decision support systems and capacity to utilize new information for planning and budgeting.

3. Strengthen teacher recruitment and professional development system.

Assessing each of the activities/products requires examining each in the context of the larger government strategy. The remainder of this section focuses on presenting our findings for the status of the current system, and a review of the structural, institutional, and agent challenges under each of the change strategies.

Change Strategy 1: Develop and apply evidence-based Service Standards across modalities of Ciclo Básico for planning and budgeting

The development of a standards-based approach to planning and budgeting is intended to promote a shift from the current adhoc and incremental practices in allocating resources in Ciclo Básico to one that more closely links the allocation of resources to enrollment projections/targets and the equitable provision of high impact inputs (infrastructure, teachers and materials). High impact inputs are being identified through a formal analysis of the relationship between assessment results in Spanish and Mathematics and school, individual and household

characteristics. These high impact inputs[39] are the basis for the development of service standards. Subsequently the standards will be utilized as "drivers" for estimating budgetary requirements. A system for annual sub sector monitoring based on the standards is also component of the change strategy. In addition to improving the efficiency and equity of planning and budgeting, the use of the service standards as benchmarks enhances the transparency of planning and budgeting decisions. The change strategy will capitalize on this enhanced transparency to advocate for increased investment in Ciclo Básico with the public and key decision makers.

Current Status

At the time of the field visit the formal analysis for identifying the high impact school characteristics was in its final stages and the process of development of draft standards for discussion within relevant MINEDUC departments was in its initial stages.

Challenges

Structural challenges:

A number of interview respondents, including members of the implementing organization, MINEDUC and PRONACOM highlighted a series of structural challenges that may impede the project from fully realizing Change Strategy 1. A number of interviewees (both project staff and MINEDUC officials) cautioned that high levels of poverty, historical patterns of marginalization of rural and indigenous populations and the perception of public education as low quality may limit the impact of technical improvements in planning and budgeting on student participation rates and learning outcomes. The interviewees also noted that the overall low levels of spending on the social sectors (including education) may be a serious constraint on how the technical developments in planning and budgeting translate into improvements in quality and coverage of Ciclo Básico. Guatemala's spending on education as a percentage of GDP was approximately 2.8 percent in 2016, down from 3 percent in 2015 and a high of nearly 3.2 percent in 2008 (https://www.theglobaleconomy.com/Guatemala/Education_spending/). Of that investment, less than half is dedicated to Ciclo Básico. In fact, the government spent approximately 239 (PPP$) per lower secondary student in 2016 compared to nearly 439 (PPP$) for primary students. While all social spending is low, a number of interviewees emphasized that youth have traditionally not been seen as an investment priority in Guatemala.

Institutional challenges:

The impending government elections may create delays in the ability of MINEDUC to instill a standards and evidence-based planning and budgeting process. During the first round of data collection, nearly all respondents identified the approaching elections as a significant challenge to the project. In Guatemala, changes in government often have far reaching consequences in terms of leadership and technical positions in government ministries – including Education. A significant change in Ministry practice like the development of standards-based planning and budgeting requires ongoing engagement with decision makers. A wholesale change in leadership resulting from a new government may require rebuilding support and confidence with an almost entirely new group of actors—a process that will take time and resources.

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[39] In Guatemala these are referred to as Oportunidades de Aprendizaje (ODAs).

Additional stakeholders – such as the Ministry of Finance – must be more involved in development of a standards-based planning and budgeting model to ensure adoption and institutionalization. A second institutional challenge identified by a number of interviewees is the need to involve additional stakeholders in the process of developing standards and a budgeting model based on those standards. Application of this model will impact practices across a number of MINEDUC entities beyond planning and finance (for example; teacher education, human resources, materials procurement, and facilities among others). Government entities that determine budgetary priorities and manage public finance processes, like the Ministry of Finance, must become advocates of the standards-based planning and budgeting process if the new practices that GEP is advocating are to have a palpable impact on the amount and pattern of spending in secondary education.[40] While stakeholders involved in the implementation process recognize the importance of the involvement of these entities, a process for engaging them in the project had not been formalized at the time of the field visit.

Government, funding organizations and implementing partners' management norms and practices can create significant challenges to adapting project plans to take advantage of strategic opportunities to influence policy and practice. A third challenge was identified by a senior MINEDUC official who indicated that management and operations norms of MCC and FHI360[41] may also present challenges to effective strategy implementation. This official expressed concern that these norms – developed to ensure accountability – may have the unintended consequence of making timely strategic modifications to timelines for implementation and deploying technical expertise for Change Strategy 1 activities more difficult. His immediate concern was deployment of technical and financial resources for the development of the standards-based practices in time to impact the 2019 budget proposals – the last before the upcoming national elections.

There needs to be more focus on creating a planning culture within MINEDUC, which is currently missing from every day practices. Two respondents within MINEDUC stressed that there is currently "no planning" for Ciclo Básico. They noted that growth in the Ciclo Básico has been incremental, so teachers have been added over time on an "as needed basis" – or in response to available budget - to respond to growing enrollment in some regions. The addition of teachers is a reaction to a need, rather than a response to policy or goals for increasing coverage or improving secondary learning outcomes. In their view, developing methods and tools for more effective planning and budgeting will have little impact without a complementary effort to improve communications and planning strategies among departments in MINEDUC, build consensus on the goals of secondary education, and provide orientation to senior – and mid-level – leadership/management on how and why the service standards can make things "work better" within MINEDUC. At this early stage, it is not clear how this challenge is being addressed by the project.

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[40] Standards-based allocations will change the distribution (improve equity across institutions) as well as require increased levels of spending.

[41] As well as those within government.

Agents-related challenges:

As Change Strategy 1 implementation is in its initial stages, the challenges at the Agent level are not yet fully visible. These challenges, which may include things such as retaining power, creating resistance to change, or the reaction of disempowered groups, are likely to become more visible once activities for developing and implementing the standards-based planning and budgeting practices are underway. The potential consequences of changes/discontinuity in policy directions and priorities as new political and technical leadership look to differentiate themselves from the previous government are also significant and difficult to anticipate at this point in time.

Change strategy 2: Strengthen or develop decision support systems and capacity to utilize new information for planning and budgeting

The implementation of a standards-based approach for planning and budgeting as well as strengthening and rationalizing teacher recruitment and professional development (Change Strategy 3) are dependent on developing new decision support systems or enhancing existing systems. Systems to be developed or enhanced under this effort include: an infrastructure management data system, a software tool for estimating teacher demand and managing teacher deployment/assignment and a remotely accessible data base of teaching resources for Ciclo Básico. The goal of the interventions is to systematize the management of school infrastructure and enable geospatial analysis of student and teacher data through its integration into SIRE.[42] The infrastructure management system and the teacher demand/teacher management tool will provide critical inputs for implementation of a standards-based planning/budgeting model (projected enrollment, teacher needs, material requirements and infrastructure). The teacher demand/management tool will also be a key input in Change Strategy 3: Strengthen teacher recruitment and development system.

The remotely accessible education resource database is intended to improve the quality of instruction in Ciclo Básico by providing teachers throughout the country ready access to teaching materials. The material will provide support to teachers in delivering the new curriculum (CNB - National Basic Education Curriculum as the vast majority of teachers were trained (and contracted) under the previous curriculum.

Current Status

FHI360 completed the detailed, formal proposals for the development of the infrastructure management system and the teacher demand/management tool in July 2018. Both documents provide a detailed review of current systems and practices and both cite the predominance of ad-hoc processes as well as describe previous efforts to develop systems that for multiple reasons were never fully implemented or fell into disuse shortly after their development. The proposals for the two tasks emphasize utilizing (and strengthening) existing systems to the degree possible and ensuring that the integration of the systems meets the needs of various entities in a single system (planning, finance, quality assurance, teacher allocation and others).

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[42] Sistema de Registros Educativos – the web-based repository for education administrative data.

Challenges

Structural challenges:

Uneven access to reliable telecommunications for synchronizing remote and centralized data and processes present the greatest structural challenge to the success of this change strategy. The level of unreliability creates a situation in which each system is designed to accept data from decentralized sources (mainly schools) in a variety of forms (remote transmission via mobile networks, electronic files provided to District offices and then uploaded into the system and submission and digitization of paper forms). These variations in practices responding to differences in accessibility to the new systems adds considerable challenges to the development of information that is consistent, reliable and timely.

Institutional challenges:

The proposed infrastructure management system will add georeferencing and geospatial analysis possibilities - not just for infrastructure management but also to support localized estimates of student demand and efficient route planning for materials distribution and monitoring missions. Various entities within MINEDUC have the need for information that brings together student, teacher and infrastructure data. The current architecture of the relevant systems is characterized by "ownership" of various data sources and results in disarticulated planning and budgeting decisions. The project proposals for the two systems to be developed emphasize effective links between the existing and new systems and ensuring that the need for ad hoc hand calculations will be reduced/eliminated. The fractured structure of the decision support systems is also reflected in management practices and accountability/incentives for professional staff. This challenge is explored in more detail below.

Staffing is an important institutional constraint to improving decision making through strengthening decision support systems. Both infrastructure and teacher management technical staff spend the majority of their time addressing emergencies or crises.[43] Without an assessment of the human resource needs (both quantity and quality) to manage and utilize the systems, they will be in danger of following the previous pattern in developing decision support systems of incomplete implementation and/or abandonment (see Propuesta de diseño, recolección, manejo y uso de datos de infraestructura para los establecimientos del nivel medio).

Just as the proposed development of decision support systems is intended to enable access to comprehensive information for decision making, the structure and incentives for professionals utilizing the systems must also support coordinated decision making. Realizing a return on the considerable investment in systems will require complementary investments in developing staff incentives and practices that facilitate and incentivize decision making practices that cut across administrative boundaries within MINEDUC (for example linking decisions about programs and facilities to teacher allocation).

Agents-related challenges:

As with Change Strategy 1, implementation of the Change Strategy 2 activities is in its initial phases – primarily the development of the technical documents. However, interviewees

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[43] As described in the systems development proposals produced for FHI 360.

identified one Agent-level challenge related to the development of the decision support system for estimating teacher demand. The implementation of the new curriculum (CNB) and the development of criteria for teaching posts affects all teachers currently holding permanent and contract teaching posts in Ciclo Básico. The development of norms for harmonizing the criteria for teachers holding posts under the previous curriculum and the position requirements under the new curriculum is a complex and potentially contentious task where the Teachers' Unions are likely to play a significant role. This issue is described in more detail under Change Strategy 3.

Change Strategy 3: Strengthen teacher recruitment and professional development system

A key element for ensuring the equitable provision of quality Ciclo Básico is the deployment of appropriately trained teachers. Current provision of teachers for Ciclo Básico is characterized by high levels of contract (rather than permanent) employment and challenges deploying appropriately trained teachers in more remote locations. In Change Strategy 3, the project proposes to strengthen the recruitment and management of teachers by developing and implementing a selection process modeled on the process currently used for primary teachers. This process is managed by a Jurado Nacional de Oposición (JNO). The JNO manages the recruitment and selection of teachers through procedures that ensure transparency and legal recourse for the employer and candidates.

While the JNO manages and provides oversight to the selection process, MINEDUC has the responsibility of establishing the criteria for selection and in determining teacher requirements (establishing new posts and eliminating posts). The proposed teacher estimation tool is intended to provide a systematic and transparent mechanism for identifying the number and type of posts required – all the way to the institution level. Once needs have been established on the basis of application of the relevant norms and standards and demographic and enrollment projections, the process of recruitment is decentralized to the appropriate subnational entity[44] where the system overseen by the JNO is implemented.

Two key initial tasks in the development of the system are a manual for recruitment and selection where the JNO monitored processes are described and an initial "catalog of posts" that describes the current teaching needs at each institution based on the criteria developed from the CNB, the program offered by the institution and relevant legal norms. The catalog is then populated with the current teaching staff at the institution and needed posts/teachers identified and consolidated into targets for recruitment and deployment.

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[44] In the case of Ciclo Básico, the District/Municipality/Institution

Current Status

In July 2018, the Manual de reclutamiento y selección de docentes para Nivel Medio (FHI360 2018) was in a discussion format and the Catálogo de puestos docentes: diagnóstico del catálogo, lineamientos para la alineación de puestos y requerimientos para la elaboración de herramienta informática. Informe final. (FHI360 2017) had been submitted as a final report. These products had been provided to a technical working group on teacher recruitment and selection. The Catalog of Posts indicated that with the current teaching force and the newly established CNB-based post criteria about 55 percent of posts were filled by a teacher that did not fully meet the CNB-based selection criteria. The Catalog report proposed a two stage process for identifying teacher requirements – 1) an administrative (central level) alignment of "old" and CNB defined posts based on close approximations of teacher qualifications and 2) an institutional-based identification of needs after an initial alignment had been completed. In August 2018, the process of alignment and subsequent processes for identifying required posts were under discussion within the technical working group.

Challenges

Structural challenges:

There are no structural challenges per se for the development of a teacher recruitment/management system for Ciclo Básico. However, differences among communities regarding ease of travel[45] and the number of potential candidates for teaching posts do present challenges to implementing the new system. The current level of contractual appointments and appointments of teachers who do not meet the specific qualifications for the post they hold are responses to these challenges.

Institutional challenges:

- ***The development and roll out of the new curriculum (CNB) appears to have taken place without a full exploration of the impact on teacher appointment.*** The institutional mandate for development of the state approved curriculum reside in DIGECUR.[46] The development and implementation of CNB has resulted in changes in the definition of teaching posts for Ciclo Básico consistent with the structure of the new curriculum. In the view of a number of interviewees, this development and implementation was undertaken without an adequate assessment of the impact on teacher management (recruitment/contracting). At the time of the field visit, progress on the implementation of the new system was stalled over the question of how (if?)[47] to incorporate the existing teaching force under the new norms for staffing. This has further complicated the management of teaching resources in Ciclo Básico – which was already characterized by high levels of contract and provisional appointments. Since that time, the implementing organization in partnership with MINEDUC have

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[45] Using the staffing norms, some posts in small schools are not full time equivalent positions. Difficulties in traveling between schools reduces the opportunities for employment in more than one institution.

[46] Dirección General de Curriculo

[47] Options range from the wholesale incorporation of current staff on the basis of close equivalencies between the old and new post requirements to more radical approaches involving requiring all existing teachers to reapply under the new norms.

engaged the teacher unions in reviewing the new curriculum; initiated the development of a catalog of teaching positions; began preparing for a payroll audit; created Web interface for eSIRH, with general consultative functions for employees. Implementers have also worked closely with MINEDUC to help process a Ministerial Agreement on teacher recruitment, which passed through directions' review. These elements show that institutional change is underway and will improve the teacher selection and recruitment process in the future.

Agents-related challenges:

The complexities of aligning the current teaching force with the new post requirements has raised concerns among teachers. The various alternatives being considered for the incorporation of current teachers have very different consequences on employment status, the possibilities for advancements on the salary scale and reassignment to more desirable locations. As representatives of the interests of teachers, the teacher unions have a keen interest in the resolution of the issue and they are represented in the technical working group on teacher recruitment. Until these issues are acceptably resolved there can be limited progress on the proposed changes in the teacher recruitment and professional development system.

E. IPC BASELINE OBSERVATIONS:

- The deliverable products available for review at the time of the baseline mission were comprehensive and of high quality and they have been produced consistent with the project timeline.

- Given that planning, resource allocation and teacher recruitment each involve multiple stakeholders, there was some concern expressed by a few interviewees that engagement with a wider representation of MINEDUC and other government entities was required. The FHI360 project team is also aware of the need to engage beyond the technical entities most closely linked to each activity/deliverable and various mechanisms for discussion have been established.

- Progress in overcoming the institutional challenges identified at baseline are difficult to monitor via a baseline, midline and endline methodology. MPR will be utilizing a Delphi process in an attempt to capture changing consensus on key themes linked to project goals and objective regarding the three change strategies. MPR will also explore the possibility of short – but more frequent – missions to repeat interviews with key stakeholders (not linked to the timeline of Activity 1 evaluation activities).

- Senior MCC leadership in Guatemala confirmed that by project end there was an expectation that there would be an observable difference in the distribution of teachers and the allocation of physical and financial resources in the subsector.[48] MPR will coordinate with FHI360 to develop a framework for measuring changes in teacher

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[48] For teachers, a closer alignment of staff and curriculum requirements and greater equity across the subsector in the distribution of teachers. For financial resources there is an expectation that resource allocation will more closely match requirements for delivering Ciclo Básico across geographical regions and different modalities.

allocation and material/financial resource allocation that reflects the overall goals of the project.

- Periodic assessments of progress in Activity 3 will continue to utilize DOC as an organizing framework. The final evaluation will also include an assessment based on the OECD DAC Criteria for International Development Evaluations: Relevance; Effectiveness, Efficiency, Impact and Sustainability.[49]

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[49] OECD Development Assistance Committee. DAC Principles for Evaluation of Development Assistance. Paris. 1991

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APPENDIX A

ANALYTICAL APPROACH

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A. Empirical specification

To assess baseline equivalence between study groups we use multilevel linear regression analysis. Multilevel regression accounts for the nested structure of the data (that is, students, teachers, and school directors are nested in school districts) and allows adjusting for design features and variation in the sizes of randomized clusters. We report both significant results and marginally significant results to minimize the risk of Type II errors (false negatives).

1. Main model

The general regression model to test for differences between study groups in school, teachers, and student characteristics at baseline can be expressed as follows:

$$(1)\ Y_{ic0} = \alpha + \beta_1 T_{ic} + \beta_2 S1_c + \beta_3 P_c + u_{c0} + e_{ic0}$$

where Y_{ic0} is the characteristic or outcome of interest for school (or teacher or student) i in district c at baseline; α is a constant term; and T_{ic} is an indicator for treatment, equal to zero for schools (or teachers or students) in districts assigned to the control group and one for schools (or teachers or students) assigned to Éxito Escolar. Accordingly, the parameter β_1 is our coefficient of interest, which indicates the difference in the outcome between the treatment and the control group. The variable $S1_c$ includes a vector of indicator variables for the strata within which random assignment of districts was conducted. The term u_{c0} is a district-specific error term. The term e_{ic0} is a school-level (or teacher- or student-level) residual.

The only difference between the school, teacher, and student models is that teacher-level models include sampling weights to adjust for differences in the sampling probability of teachers in schools of varying sizes.

Strata. All regression models include district stratum dummies. Districts were defined by the Ministry of Education and include 8 lower secondary schools on average (range: 2 to 18 schools). We created 20 strata (including 5 districts each[50]) based on the department in which the district is located and students' average performance in the 2013[51] reading and mathematics standardized tests. We include the stratification indicators to capture the design effect generated by the stratified randomization. In other words, stratification (conducting random assignment within groups of similar districts) improves efficiency by reducing the amount of variation between districts of different treatment status, but at the same time imposes a small penalty associated with the need to account for the block effect associated with each group (stratum) of similar districts.

Sampling weights. For the teacher models, the data in Equation (1) were reweighted by the inverse probability of their selection to correct for under-representation of teachers in large

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[50] Because there were 103 districts and we randomized within strata of 5 districts each, in 3 strata we formed pairs of two districts that were treated as a single district for randomization purposes.

[51] This was the most recent national assessment as of 2017.

schools, relative to the population of eligible teachers in the school. We include these weights because we sampled up to 3 teachers across all schools, regardless of the number of eligible teachers. Therefore, teachers in smaller schools had a higher probability of being selected than those in larger schools. By using weights, the results from our sample approximate what would have occurred in the population of eligible teachers in these schools. Eligible teachers were those who taught 7th grade mathematics, language and communication, or natural sciences. We computed the weight for each teacher i in school s, separately for each subject of interest, using the following formula:

$$(3) \quad weight_{is} = \frac{Number\ of\ eligible\ teachers\ per\ school\ for\ subject\ x}{Number\ of\ teachers\ sampled\ in\ the\ study\ for\ subject\ x}$$

2. Subgroups

Exploring the variation in impacts by subgroups is of interest to the evaluation. Key subgroups include those defined by students' gender (1 if female, 0 if male) and whether the student self-identifies as "ladino" or not.[52] We evaluate baseline equivalence for a particular subgroup by including the appropriate treatment by subgroup interaction term as well as a dummy for the subgroup of interest in Equation (1).

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[52] The term ladino commonly refers to non-indigenous Guatemalans. In our analysis, we classified as ladino anyone who self-identified as ladino, even if they also selected another group.

APPENDIX B

DATA COLLECTION INSTRUMENTS

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DATA COLLECTION INSTRUMENTS

This Appendix provides a brief description and a copy of the teacher, director, and Stallings classroom observation instruments that Mathematica developed and adapted to collect primary data in five study departments in Guatemala. The purpose of all of the instruments was to collect data on different characteristics so that we could determine the extent to which schools in the treatment and control groups were equivalent. The results of these surveys also helped inform the development of our qualitative data collection protocols. All instruments developed by Mathematica are the property of MCC.[53]

1. Teacher and director surveys

Teacher survey. Mathematica developed the teacher survey instrument directly in Spanish. The purpose of the survey was to collect information from 7th and 8th grade teachers on their education and professional experience, including employment in other schools and other socio-demographic characteristics; use of time in school and at home and absences from school; use of assessments and pedagogical innovations in the classroom; professional development and training; perceptions about gender equality and the role that boys and girls play in society; school environment and condition of classrooms; information about the work and the household of teachers; and student attendance in their classroom.

Director survey. Mathematica developed the director survey instrument directly in Spanish. The purpose of the school director survey was to collect information about the school and the teachers who work at the school; existing school networks with primary schools; existing learning communities with other lower secondary schools; director's use of time at the school or home and the school climate, including participation of parents in school activities; school environment conditions, such as infrastructure and sanitation and hygiene; director's professional development and training; director's education, professional experience, and other social demographic characteristics.

Pilot test. After the teacher and director instruments were drafted, we refined the items with input from MINEDUC and our data collection partners. We pilot tested the instruments in 25 schools from five departments that neighbor the study departments. We tested the instruments' internal consistency, sequencing, flow, and comprehension of questions. We used the results from the pilot test to adapt and improve the internal consistency of the instruments before conducting the actual data collection process. The pilot test was conducted in May 2018.

2. Stallings classroom observation

Stallings classroom observation. We used the Stallings Classroom Snapshot (SCS) to complete structured classroom observations (Stallings and Mohlman 1988). The SCS measures teachers' use of instructional time and materials, core pedagogic abilities, and the ability to engage students. It uses categories that are easy to understand and that have been shown to produce high inter-rater reliability among observers with limited training, making the tool well suited for data collection with large-scale samples in developing countries (Jukes et al. 2006).

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[53] DIGEDUCA developed similar teacher and school director questionnaires to collect data for purposes outside the scope of the impact evaluation.

We made a few adaptations to the SCS instrument with consideration given to the Guatemalan context and the evaluation's goals. For example, we moved the cooperative category, which was under the materials question, into a separate question. This category is not a material, but captures whether the students work together in a group to produce a common product. We also added a question about whether the students work together in a group, but each one is producing an individual product. To verify the consistency of observers' coding, we added a section for notes where observers can record their observation for each individual snapshot.

MCC Guatemala Threshold Education Project

DIRECTOR SURVEY
BASELINE MAY 2018

1. SURVEY ID: |___|___|

2. INTERVIEWER ID: |___|___|

3. SUPERVISOR ID: |___|___|

4. SURVEY DATE: |_D_|_D_| / |_M_|_M_| / |_2_|_0_|_1_|_8_|

5. START TIME: |___|___|: |___|___| 6. END TIME: |___|___|: |___|___|

RECORD THE TIME IN 24 HOUR FORMAT (FOR EXAMPLE, 13:00 INSTEAD OF 1:00 PM).

7. SCHOOL NAME: _____

8. SCHOOL CODE: |___|___| - |___|___| - |___|___|___|___| - |_4_|_5_|

8A. VERIFY THE SCHOOL NAME AND CODE AND IF THEY DO NOT CORRESPOND TO THE SAMPLE LIST, PLEASE INCLUDE A NOTE HERE:

_____

9. MUNICIPALITY: _____

10. DEPARTMENT:

   16 ☐ Alta Verapaz   20 ☐ Chiquimula   21 ☐ Jalapa   3 ☐ Sacatepéquez   7 ☐ Sololá

11. LOWER SECONDARY GRADES OFFERED AT THE SCHOOL:

   1 ☐ Seventh   2 ☐ Eight   3 ☐ Ninth

12. NUMBER OF SECTIONS IN:

   Seventh grade |___|___| Eight grade |___|___| Ninth grade |___|___|

13. LOWER SECONDARY SHIFT AT THE SCHOOL:

   1 ☐ Morning   2 ☐ Afternoon   3 ☐ Evening   4 ☐ Double

14. NUMBER OF TEACHERS AT THE SCHOOL: |___|___|

15. LOCATION TYPE: 1 ☐ Urban   2 ☐ Rural

16. DIRECTOR FIRST NAMES: _____

   _____

17. DIRECTOR LAST NAMES: _____

18. DIRECTOR DOB: (MONTH, DAY, YEAR): |___|___| / |___|___| / |___|___|___|___|

19. SCHOOL PHONE NUMBER: |___|___|___|___|___|___|___|___|

20. DIRECTOR PHONE NUMBER: |___|___|___|___|___|___|___|___|

21. DIRECTOR GENDER: 1 ☐ Female 2 ☐ Male

22. SURVEY RESULT:		
1 ☐ Complete	2 ☐ Incomplete	3 ☐ Refused

INFORMED CONSENT

Dear Director, my name is _____ [INTERVIEWER NAME] and I am working with the data collection firm, ESPIRALICA. [PRESENT CREDENTIALS]. I am working on a study about education in Guatemala. The study is sponsored by the Millennium Challenge Corporation (MCC), an American federal agency dedicated to international development, and is conducted by Mathematica Policy Research, an American research firm. The Ministry of Education is conducting its own study in the same schools and will visit these schools to collect data using the same teacher survey as well as implementing additional instruments. The Ministry of Education also supports the current study conducted by Mathematica.

The study's goal is to understand teachers' and directors' attitudes; the access to pedagogical support services; professional development activities; pedagogical approaches; and the time dedicated to teaching, administrative, and professional development activities.

By this means, we request your authorization and your support in the following processes:

1. To conduct a survey with you for about an hour,
2. To conduct a survey with three teachers about their training as teachers and about their pedagogical practices for approximately one hour each, and
3. To visit the teachers' classrooms to conduct an observation of one class period, without interrupting class activities.

If you agree to participate, it is likely that we will ask you to participate in a similar survey in 2020 and in a focus group discussion this year, in 2019 and in 2020.

All the information collected through this survey and classroom observation will be used for statistical purposes only and it will be maintained in strict privacy by ESPIRALICA, Mathematica, MCC, DIGEDUCA, and researchers from these organizations with the maximum guarantee permitted under the laws of the United States and Guatemala. The study results will be presented globally in a report and we will not include any personal information which could be used to identify you or the school.

Your participation is voluntary and will not affect your work in this school in any way. You may skip any questions that you do not wish to answer or stop the survey at any time, without any negative consequences for you or your job.

There are no direct benefits from participating in this interview, however, your participation is very important to our study and is part of a larger effort we are making to provide relevant information to help improve education in Guatemala.

You can contact Dr. César Valenzuela (Espirálica's Director) at 4931-9132 (cell phone number in Guatemala); Dr. Catalina Torrente (Researcher at Mathematica) at 001-510-285-4641; or Francisco Ureta (in the Ministry of Education), 2334-0523-ext. 3 if you have questions, concerns, comments or complaints about the study or your rights as a participant.

Before we begin, this is the time when you can ask all the questions you have about the study. The most important is for you to understand my work and the collaboration that I expect on your part. Do you have any questions?

[INTERVIEWER: PROVIDE AS COMPLETE RESPONSE AS POSSIBLE]

00. Do you agree to participate in the survey?

₁ ☐ Yes   **Please sign here:** [INTERVIEWER: KEEP ONE COPY WITH THE DIRECTOR'S SIGNATURE AND GIVE HIM/HER A COPY WITHOUT A SIGNATURE]

_____

₀ ☐ No   **Thank you!**   [INTERVIEWER: END THE SURVEY]

SCHOOL CODE: |___|___| - |___|___| - |___|___|___|___| - | 4 | 5 |

A. SCHOOL DEMOGRAPHIC INFORMATION

We will begin with a few questions about the school and the teachers who work at this school.

A1a. **In which modality do students receive classes?**

SELECT ONLY ONE ANSWER

- 1 ☐ INEB
- 2 ☐ TELESECUNDARIA
- 3 ☐ NUFED
- 4 ☐ COOPERATIVA
- 5 ☐ PEMEM
- 6 ☐ OTHER (specify) _____
- D ☐ Do not know
- R ☐ Does not respond

A1b. **Besides a director, are you also a teacher with an assigned grade?**

- 1 ☐ Yes
- 0 ☐ No **GO TO A1d**
- D ☐ Do not know **GO TO A1d**
- R ☐ Does not respond **GO TO A1d**

A1c. **Which grades do you teach?**

MARK ALL THAT APPLY

Lower Secondary			DK	DNR
7	**8**	**9**		
1 ☐	2 ☐	3 ☐	D ☐	R ☐

A1d. **How many teachers work at this school in the following categories:**

INTERVIEWER: IF THE DIRECTOR IS A TEACHER, INCLUDE HIM/HER IN THESE NUMBERS.

		MEN	WOMEN	DO NOT KNOW	DOES NOT RESPOND
a.	Total number of teachers	|__|__|	|__|__|	D ☐	R ☐
b.	Number of mathematics teachers in grade 7	|__|__|	|__|__|	D ☐	R ☐
c.	Number of communication teachers in grade 7	|__|__|	|__|__|	D ☐	R ☐
d.	Number of natural sciences teachers in grade 7	|__|__|	|__|__|	D ☐	R ☐
e.	Number of teachers with contract type rank 011	|__|__|	|__|__|	D ☐	R ☐
f.	Number of teachers with contract type rank 021	|__|__|	|__|__|	D ☐	R ☐
g.	Number of teachers with contract type rank 022	|__|__|	|__|__|	D ☐	R ☐
h.	Number of teachers in training	|__|__|	|__|__|	D ☐	R ☐
i.	Does your schools have any other type of teachers that we have not included? (specify) _____	|__|__|	|__|__|	D ☐	R ☐

A2. **How many teachers attended the school yesterday (or the most recent work day)? If you don't know the exact number, please give us an estimate.**

TEACHERS |___|___| A □ Does not apply D □ Do not know

R □ Does not respond

A3. **How often were the following lower secondary seventh grade teachers absent in the last month:**

CHECK THE DIRECTOR'S ATTENDANCE RECORDS

		NUMBER OF DAYS ABSENT	DO NOT KNOW	DOES NOT RESPOND
a. Grade 7 mathematics?	TEACHER 1	|___|___|	D □	R □
a. Grade 7 mathematics?	TEACHER 2	|___|___|	D □	R □
a. Grade 7 mathematics?	TEACHER 3	|___|___|	D □	R □
b. Grade 7 communication?	TEACHER 1	|___|___|	D □	R □
b. Grade 7 communication?	TEACHER 2	|___|___|	D □	R □
b. Grade 7 communication?	TEACHER 3	|___|___|	D □	R □
c. Grade 7 natural sciences?	TEACHER 1	|___|___|	D □	R □
c. Grade 7 natural sciences?	TEACHER 2	|___|___|	D □	R □
c. Grade 7 natural sciences?	TEACHER 3	|___|___|	D □	R □

A4. **Does your school have multi-grade classrooms (meaning, students from different grade levels are in the same classroom and receive classes from the same teacher)?**

1 □ Yes

0 □ No **GO TO A6**

D □ Do not know **GO TO A6**

R □ Does not respond **GO TO A6**

A5. **Does your school have any classrooms that are not multi-grade?**

1 □ Yes

0 □ No

D □ Do not know

R □ Does not respond

A6. How long is a typical class in this school (in minutes)?

|___ |___|___| MINUTES D ☐ Do not know R ☐ Does not respond

A7. Is this school part of a school network <u>with primary schools</u>? A school network is a territorial form of organization that integrates primary and lower and upper secondary schools so that they can work together, plan and conduct activities focused on achieving the transition between grade levels, and improve the education conditions and quality in their education centers.

   1 ☐ Yes

   0 ☐ No   **GO TO A10**

   D ☐ Do not know   **GO TO A10**

   R ☐ Does not respond   **GO TO A10**

A8. Do you participate in this school network?

   1 ☐ Yes

   0 ☐ No

   D ☐ Do not know

   R ☐ Does not respond

A9. Do the teachers in this school participate in this network?

   1 ☐ Yes

   0 ☐ No   **GO TO A10**

   D ☐ Do not know   **GO TO A10**

   R ☐ Does not respond   **GO TO A10**

A9a. How many teachers in this school participate in this network?

|___|___| TEACHERS D ☐ Do not know R ☐ Does not respond

A9b. How often do teachers participate in this network?

SELECT ONLY ONE ANSWER

   1 ☐ At least once a week

   2 ☐ At least once a month

   3 ☐ At least once a year

   D ☐ Do not know

   R ☐ Does not respond

A9c. **What topics are covered in the school network's meetings?**

MARK ALL THAT APPLY. DO NOT READ THE OPTIONS.

- 1 ☐ How to work with primary schools to connect students from primary schools to lower secondary centers
- 2 ☐ Other (specify) _____
- D ☐ Do not know
- R ☐ Does not respond

A10. **A "learning community" is a strategy for continual teacher training, in which they work together and support each other to improve education practices. Is this school part of a learning community <u>with other lower secondary schools</u> close to your school?**

- 1 ☐ Yes
- 0 ☐ No
- D ☐ Do not know
- R ☐ Does not respond

A11. **Were you invited to participate in a learning community <u>with other lower secondary schools</u>?**

- 1 ☐ Yes
- 0 ☐ No
- D ☐ Do not know
- R ☐ Does not respond

Now we have a few questions about the students in this school.

A12. **How many students are enrolled in each lower secondary grade?**

IF THERE ARE NO STUDENTS IN A GRADE LEVEL, REGISTER 0.

		…seventh grade?	…eighth grade?	…ninth grade?	DOES NOT APPLY	DOES NOT RESPOND
a.	How many boys are in:	|__|__|__|	|__|__|__|	|__|__|__|	A ☐	R ☐
b.	How many girls are in:	|__|__|__|	|__|__|__|	|__|__|__|	A ☐	R ☐
c.	Total	|__|__|__|	|__|__|__|	|__|__|__|	A ☐	R ☐

A13. Now I will ask you about the students in lower secondary with Special Education Needs (NEE) and disabilities (for example, visual, hearing, physical, attention deficit, learning disability) in your school. Please tell me the number of students in each category: [INTERVIEWER: SHOW THE DIRECTOR THE LAMINATED CARD]

a	b	c	d	e	f	g
					Are there students with other NEE or learning problems? _____	What is the total number of students with NEE and disabilities?
VISUAL DISABILITY	HEARING DISABILITY	PHYSICAL DISABILITY	ATTENTION DEFICIT	LEARNING DISABILITY		
|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|
D ☐ DO NOT KNOW	D ☐ DO NOT KNOW	D ☐ DO NOT KNOW	D ☐ DO NOT KNOW	D ☐ DO NOT KNOW	D ☐ DO NOT KNOW	D ☐ DO NOT KNOW
R ☐ DOES NOT RESPOND	R ☐ DOES NOT RESPOND	R ☐ DOES NOT RESPOND	R ☐ DOES NOT RESPOND	R ☐ DOES NOT RESPOND	R ☐ DOES NOT RESPOND	R ☐ DOES NOT RESPOND

A14. Thinking only about the sections attended by students in lower secondary, how many weekly periods are there for:

	NUMBER OF PERIODS IN LOWER SECONDARY	DOES NOT APPLY	DOES NOT RESPOND
a. …**Mathematics?**	|__|__|	A ☐	R ☐
b. …**Communication?**	|__|__|	A ☐	R ☐
c. …**Natural sciences?**	|__|__|	A ☐	R ☐

A15. **From the following list of options, please tell me which ones do you consider as the three most common reasons for school dropout from lower secondary grades?**

[INTERVIEWER: READ ALL ITEMS AND SHOW THE LAMINATED CARD TO THE DIRECTOR TO SPECIFY THE 3 MOST COMMON CAUSES, BUT REMEMBER THAT YOU CAN MARK LESS THAN 3]

	RECORD A MAXIMUM OF 3 RESPONSES
a. Illness	1 ☐
b. Student pregancy	2 ☐
c. Drug addiction or alcoholism (student or in the family)	3 ☐
d. Weak academic skills	4 ☐
e. Repeating grades	5 ☐
f. Natural disasters (e.g., rain/flood, landslides, earthquake)	6 ☐
g. Lack of money (e.g., for transport, clothing or school articles)	7 ☐
h. Difficulties getting to school (e.g., distance from home to school, difficulties finding transport)	8 ☐
i. Family obligations (e.g., helping with domestic work, caring for a sick family member)	9 ☐
j. Labor obligations (including the harvest season)	10 ☐
k. Family migration	11 ☐
l. Risk of harassment or violence (including gang presence)	12 ☐
m. Frequent teacher absence	13 ☐
n. Poor conditions in the school (e.g., poor sanitation, insecurity)	14 ☐
o. Other (specify) _____	15 ☐
DOES NOT KNOW	D ☐
DOES NOT RESPOND	R ☐

B. DIRECTOR USE OF TIME AND SCHOOL CLIMATE

Now, we would like to learn about how you use the time dedicated to work as the director of this school. This can be work at school or at home.

B1.

[INTERVIEWER: IF THE DIRECTOR IS ALSO A TEACHER, REMIND HIM/HER THAT HE/SHE HAS TO THINK ONLY ABOUT THE TIME DEDICATED TO THE SCHOOL DIRECTOR ROLE. SHOW THE LAMINATED CARD WITH THE RESPONSE OPTIONS TO THE DIRECTOR]

		How often [READ THE ACTIVITY]?									
		Does not do the activity	Daily	Weekly	Monthly	Bimonthly	Semiannually	Annually	DOES NOT KNOW	DOES NOT RESPOND	DOES NOT APPLY
a. Serve the role of an Educational Supervisor?	1 ☐ Yes → 0 ☐ No R ☐ DNR	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐	
b. Conduct other tasks and administrative reports?	1 ☐ Yes → 0 ☐ No R ☐ DNR	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐	
c. Do planning?	1 ☐ Yes → 0 ☐ No R ☐ DNR	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐	
d. Obtain additional resources for the school (e.g., hold a raffle to buy didactic material, pictures, etc.)?	1 ☐ Yes → 0 ☐ No R ☐ DNR	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐	
e. Carry out school maintenance or replace school infrastructure (e.g., broken latrines, broken windows, leaking roofs)?	1 ☐ Yes → 0 ☐ No R ☐ DNR	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐	
f. Participate in professional development activities? (e.g., training in the teaching of a subject)?	1 ☐ Yes → 0 ☐ No R ☐ DNR	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐	
g. Observe teachers in their classrooms?	1 ☐ Yes → 0 ☐ No R ☐ DNR	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐	A ☐

			How often [READ THE ACTIVITY]?									
			Does not do the activity	Daily	Weekly	Monthly	Bimonthly	Semiannually	Annually	DOES NOT KNOW	DOES NOT RESPOND	DOES NOT APPLY
h. Meet with teachers from the school?	1 ☐ Yes → 0 ☐ No R ☐ DNR		0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐	A ☐
i. Provide additional academic support to students with low performance outside of school hours?	1 ☐ Yes → 0 ☐ No R ☐ DNR		0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐	
j. Meet with parents?	1 ☐ Yes → 0 ☐ No R ☐ DNR		0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐	

B2. **Next, I will read a few statements related with the work of the teachers in this school. For each statement, please tell me how much you agree or disagree, using the following options** [SHOW THE DIRECTOR THE LAMINATED CARD]**: Disagree strongly, disagree somewhat, agree somewhat, agree strongly.**

INTERVIEWER: READ EACH STATEMENT AND MARK ONE OPTION PER ROW

	DISAGREE STRONGLY	SOMEWHAT DISAGREE	SOMEWHAT AGREE	AGREE STRONGLY	DO NOT KNOW	DOES NOT RESPOND	DOES NOT APPLY
a. The communication between teachers is good.	1 ☐	2 ☐	3 ☐	4 ☐	D ☐	R ☐	A ☐
b. Teachers cooperate with the activities proposed by the school director.	1 ☐	2 ☐	3 ☐	4 ☐	D ☐	R ☐	A ☐
c. Teachers feel proud of belonging to this school.	1 ☐	2 ☐	3 ☐	4 ☐	D ☐	R ☐	
d. The relationship between students in this school is good.	1 ☐	2 ☐	3 ☐	4 ☐	D ☐	R ☐	
e. The relationship between teachers and parents is good.	1 ☐	2 ☐	3 ☐	4 ☐	D ☐	R ☐	
f. The communication with local education authorities is good.	1 ☐	2 ☐	3 ☐	4 ☐	D ☐	R ☐	
g. The communication with national education authorities is good.	1 ☐	2 ☐	3 ☐	4 ☐	D ☐	R ☐	

B3. **According to your knowledge, in this school there are…**

INTERVIEWER: READ EACH QUESTION AND MARK ONE OPTION PER ROW	NO	YES	DOES NOT KNOW	DOES NOT RESPOND
a. …students who are absent due to illness?	0 ☐	1 ☐	D ☐	R ☐
b. …students with family problems?	0 ☐	1 ☐	D ☐	R ☐
c. …conflicts (between students, teachers, students and teachers, or administrative personnel)?	0 ☐	1 ☐	D ☐	R ☐
d. …pregnant students?	0 ☐	1 ☐	D ☐	R ☐
e. …students who have made other students pregnant?	0 ☐	1 ☐	D ☐	R ☐
f. …students who work to earn money?	0 ☐	1 ☐	D ☐	R ☐
g. … teachers who have made students pregnant?	0 ☐	1 ☐	D ☐	R ☐
h. …students who are discriminated because of their ethnicity?	0 ☐	1 ☐	D ☐	R ☐
i. …students who are discriminated because of a disability?	0 ☐	1 ☐	D ☐	R ☐
j. …students who are victims of harassment or, physical, psychological or sexual violence?	0 ☐	1 ☐	D ☐	R ☐
k. … students who are repeating grades?	0 ☐	1 ☐	D ☐	R ☐
l. …students who are in gangs?	0 ☐	1 ☐	D ☐	R ☐
m. … students who are extorting others?	0 ☐	1 ☐	D ☐	R ☐
n. …students who steal things?	0 ☐	1 ☐	D ☐	R ☐

B4. **Now, I will ask you a few questions about the participation of parents in some activities. Please tell me whether parents participate:** [SHOW THE LAMINATED CARD]**.**

[INTERVIEWER: READ EACH STATEMENT AND MARK ONE OPTION PER ROW]

How often do parents…	Doesn't occur	Daily	Weekly	Monthly	Bimonthly	Semiannually	Annually	DO NOT KNOW	DOES NOT RESPOND
a. Participate in the education process of their children?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
b. Participate in the school networks? Meaning, in meetings with primary schools to promote the transition from primary to lower secondary.	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
c. Help in classes?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
d. Attend the parent meetings?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
e. Participate in activities to raise funds for the school?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
f. Volunteer to support students with their tasks (tutoring before or after school hours, additional tasks)?	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐

C. SCHOOL ENVIRONMENT

The following questions are about the school environment.

C1. **Does your school have the following types of infrastructure or resources?**

	YES	NO	DO NOT KNOW	DOES NOT RESPOND
Wheelchair ramps for people with disabilities	1 ☐	0 ☐	D ☐	R ☐
Special doors (1 meter or larger) for people with disabilities	1 ☐	0 ☐	D ☐	R ☐
Braille system for teaching	1 ☐	0 ☐	D ☐	R ☐
Toilets with access for people with physical disabilities	1 ☐	0 ☐	D ☐	R ☐

C2. **What is the main material of the floors in the school (please exclude the patio)?**

SELECT ONLY ONE OPTION

1 ☐ Soil

2 ☐ Unfinished wood

3 ☐ Cement

4 ☐ Ceramic

5 ☐ Finished wood

6 ☐ Other (specify) _____

D ☐ Do not know

R ☐ Does not respond

C3. **What is the main material of the walls in the school?**

SELECT ONLY ONE OPTION

1 ☐ Unfinished wood (not treated)

2 ☐ Adobe

3 ☐ Sheeting (e.g. corrugated metal)

4 ☐ Cement block

5 ☐ Brick

6 ☐ Finished wood (treated)

7 ☐ Bajareque (mixture of adobe with straw and / or cane)

8 ☐ Lepa (cutting from tree trunk for construction material)

9 ☐ Other (specify) _____

D ☐ Do not know

R ☐ Does not respond

C4. **What is the main material of the ceiling in the school?**

SELECT ONLY ONE OPTION

1 ☐ Perishable or fragile material (straw, palm, or similar)

2 ☐ Corrugated metal sheeting

3 ☐ Asbestos sheeting (e.g., Duralite)

4 ☐ Roofing tile

5 ☐ PVC tile

6 ☐ Terraza fundida (Molten ceiling)

7 ☐ Other (specify) _____

D ☐ Do not know

R ☐ Does not respond

C5. **What type of toilets for students does this school have?**

SELECT ONLY ONE OPTION

1 ☐ There are no toilets   **GO TO C8**

2 ☐ Toilets connected to septic tank or drainage network

3 ☐ Latrine or well (includes washable latrine)

4 ☐ Other (specify)_____

D ☐ Do not know

R ☐ Does not respond

C6. **Are the toilets separated by gender?**

1 ☐ Yes

0 ☐ No

D ☐ Do not know

R ☐ Does not respond

C7. **Are there sinks for handwashing near the toilets?**

1 ☐ Yes

0 ☐ No

D ☐ Do not know

R ☐ Does not respond

C8.   How do you obtain water in the school?

SELECT ONLY ONE ANSWER

- 1 ☐   Natural source (river, spring, lake, community well, rainwater)
- 2 ☐   Public tap (administered by the municipality)
- 3 ☐   Plumbing (municipal system, does not include water from a natural source that is piped)
- 4 ☐   Purchased
- 5 ☐   Other (specify)_____
- D ☐   Do not know
- R ☐   Does not respond

C9.   Is there a source of drinking water in the school (for human consumption)?

- 1 ☐   Yes (can include bottled water)
- 0 ☐   No
- D ☐   Do not know
- R ☐   Does not respond

C10.   From the following list of resources, please tell me which ones are available at the school. For those that are available, please tell me if [SHOW THE LAMINATED CARD TO THE DIRECTOR AND READ THE DEFINITIONS]**: Does not function or its failure is imminent, Needs repairs, or It is in good condition.**

- DOES NOT FUNCTION OR ITS FAILURE IS IMMINENT – It cannot continue to perform its original function without significant repairs or is in such a condition that its failure is imminent
- NEEDS REPAIRS – Requires some preventative repairs to avoid major deterioration and to restore it to its original form
- GOOD CONDITION – It is functioning as intended and does not need any repairs

c11. Please tell us in what condition is the…

[INTERVIEWER NOTE: READ EACH SENTENCE AND MARK ONE OPTION PER ROW]

Does the school have…	NO	YES	DOES NOT FUNCTION / FAILURE IS IMMINENT	NEEDS REPAIRS	IT IS IN GOOD CONDITION	DO NOT KNOW	DOES NOT RESPOND
a. Exclusive office for the director?	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐
b. Separate kitchen area?	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐
c. Separate eating area?	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐
d. Sports field?	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐
e. School garden?	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐
f. Manual arts workshop?	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐
g. Library?	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐
h. Science lab?	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐
i. Computer lab?	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐

c11. Please tell us in what condition is the…

[INTERVIEWER NOTE: READ EACH SENTENCE AND MARK ONE OPTION PER ROW]

Does the school have…	NO	YES	DOES NOT FUNCTION / FAILURE IS IMMINENT	NEEDS REPAIRS	IT IS IN GOOD CONDITION	DO NOT KNOW	DOES NOT RESPOND
j. Computers for teachers (that they can use)	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐
k. Computers for students	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐
l. Internet service (active) for teachers' use	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐
m. Internet service (active) for students' use	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐
n. Multimedia projectors	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐
o. Video player	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐
p. DVD player	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐
q. Television	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐
r. Electric service	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐
s. Stereo system	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐
t. Didactic material (e.g., educational sheets, maps)	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐
u. Ceiling	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐
v. Floor	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐
w. Interior walls	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐
x. Exterior walls	0 ☐	1 ☐ →	1 ☐	2 ☐	3 ☐	D ☐	R ☐

C12. **Now we would like to ask you about the conditions in your classroom that may facilitate or impede teachers' ability to teach. For the following problems, please indicate if this is a problem that impacts your school, or not.**

INTERVIEWER: READ EACH STATEMENT AND MARK ONE OPTION PER ROW

		IMPACTS THE SCHOOL	DOES NOT IMPACT SCHOOL	DO NOT KNOW	DOES NOT RESPOND
a.	Lack of desks and chairs in good condition for all students	1 ☐	0 ☐	D ☐	R ☐
b.	Insufficient lighting (there isn't sufficient light)	1 ☐	0 ☐	D ☐	R ☐
c.	Problems related to ventilation and temperature (too hot or too cold)	1 ☐	0 ☐	D ☐	R ☐
d.	Exterior noise	1 ☐	0 ☐	D ☐	R ☐
e.	Interior noise	1 ☐	0 ☐	D ☐	R ☐
f.	Presence of smoke, dust, or contaminants	1 ☐	0 ☐	D ☐	R ☐

D. DIRECTOR TRAINING

Now, I have a few questions about the type of training and professional activities that you received in the past.

D1a. **Did you attend any training or professional development activities last year (2017)?**

SELECT ONLY ONE OPTION

1 ☐ Yes

0 ☐ No **GO TO D2**

D ☐ Do not know **GO TO D2**

R ☐ Does not respond **GO TO D2**

D1b. **In how many training or professional development activities did you participate last year (2017)?**

|__|__| D ☐ Does not know R ☐ Does not respond

D1c. **In the training activities in which you participated, did you cover the following topics?**

INTERVIEWER NOTE: READ EACH ITEM AND MARK ONE OPTION PER ROW	YES	NO	DOES NOT KNOW	DOES NOT RESPOND
a. Information and communications technology (ICT)	1 ☐	0 ☐	D ☐	R ☐
b. Active pedagogy strategies	1 ☐	0 ☐	D ☐	R ☐
c. Content for a specific subject (for example, math, natural sciences and technology, communication)	1 ☐	0 ☐	D ☐	R ☐
d. Training in student transition from lower to upper secondary	1 ☐	0 ☐	D ☐	R ☐
e. Professional orientation	1 ☐	0 ☐	D ☐	R ☐
f. Gender equality	1 ☐	0 ☐	D ☐	R ☐
g. Developing soft skills in students, such as problem solving, communication, teamwork, time management, responsibility, leadership skills	1 ☐	0 ☐	D ☐	R ☐
h Education inclusion	1 ☐	0 ☐	D ☐	R ☐
i. Administrative management	1 ☐	0 ☐	D ☐	R ☐
j. Leadership	1 ☐	0 ☐	D ☐	R ☐
k. Curriculum development	1 ☐	0 ☐	D ☐	R ☐
l. Community participation	1 ☐	0 ☐	D ☐	R ☐
m. Human resources	1 ☐	0 ☐	D ☐	R ☐
n. Alternancia[54]	1 ☐	0 ☐	D ☐	R ☐
o. Other (specify): _____	1 ☐	0 ☐	D ☐	R ☐

---

[54] Alternancia is a modality where students take lessons in the classroom but continue learning outside of the classroom in real-world settings such as the farm.

	Topics (RECORD THE CODES FROM THE ABOVE LIST)	D1d. What is the name of the institution that conducted the training on [TOPIC]? Think about the 5 most recent trainings
1	|___| Topic code (a-o)	|___| Institution code
2	|___| Topic code (a-o)	|___| Institution code
3	|___| Topic code (a-o)	|___| Institution code
4	|___| Topic code (a-o)	|___| Institution code
5	|___| Topic code (a-o)	|___| Institution code

INSTITUTION CODES FOR D1d:

1 Ministry of Education
2 FHI 360
3 Administrative technical coordination
4 Telefónica Foundation
5 San Carlos University of Guatemala
6 Other (specify) _____
7 Other (specify) _____
D Do not know
R Does not respond

D2a. Did you receive any pedagogical support in 2017?

1 ☐ Yes

0 ☐ No **GO TO D3**

D ☐ Do not know **GO TO D3**

R ☐ Does not respond **GO TO D3**

D2b. How many times did you receive pedagogical support in 2017?

|___|___| TIMES   D ☐ Do not know   R ☐ Does not respond

D2c. Who conducted the pedagogical support? [INTERVIEWER NOTE: DO NOT READ THE OPTIONS]

MARK ALL THAT APPLY

1 ☐ The Ministry of Education

2 ☐ FHI 360

3 ☐ Éxito Escolar Program

4 ☐ Other (specify) _____

D ☐ Do not know

R ☐ Does not respond

D3. **In your opinion, of the following aspects, which are the three that can best help students continue their studies and advance to higher education levels?**

[INTERVIEWER: SHOW THE LAMINATED CARD TO THE DIRECTOR AND READ ALL THE ITEMS ALOUD. MARK THE THREE MOST IMPORTANT ASPECTS BUT REMEMBER THAT YOU CAN MARK LESS THAN 3]

1 ☐ Extracurricular activities

2 ☐ Education materials

3 ☐ Provide nutrition

4 ☐ Adequate water, sanitation and hygiene services

5 ☐ Help with school tasks outside of class

6 ☐ Support from parents at home

7 ☐ Tutoring and classes to even out and reinforce knowledge during the school year

8 ☐ Developing soft skills in students, such as problem solving, communication, teamwork, time management, responsibility, leadership skills

9 ☐ Secure school environment

10 ☐ Scholarships

11 ☐ Other (specify) _____

D ☐ Do not know

R ☐ Does not respond

D4. **Of the following aspects, which are the three that can best help students make the transition to the workforce?**

[INTERVIEWER: SHOW THE LAMINATED CARD TO THE DIRECTOR AND READ ALL THE ITEMS ALOUD. MARK THE THREE MOST IMPORTANT ASPECTS BUT REMEMBER THAT YOU CAN MARK LESS THAN 3]

MARK ALL THAT APPLY

1 ☐ Professional orientation

2 ☐ Organizing extracurricular activities

3 ☐ Tutoring and classes to even out and reinforce knowledge during the school year

4 ☐ Developing soft skills in students (for example, problem solving, communication, teamwork, time management, responsibility, leadership skills)

5 ☐ Vocational and occupational training (for example, automotive mechanics, carpentry, textile work, baking, tourism, etc.)

6 ☐ Productive projects

7 ☐ Links to work or entrepreneurship sources

8 ☐ Other (specify) _____

D ☐ Do not know

R ☐ Does not respond

E. DIRECTOR SOCIAL DEMOGRAPHIC CHARACTERISTICS

Now we would like to ask you a few questions related to your education and professional experience.

E1a. **Was studying education or pedagogy your first choice of study?**

- ₁ ☐ Yes
- ₀ ☐ No
- A ☐ Does not apply (did not study education or pedagogy)
- D ☐ Do not know
- R ☐ Does not respond

E1b. **What major did you study at the secondary level?**

MARK ALL THAT APPLY

- ₁ ☐ Baccalaureate
- ₂ ☐ School teaching
- ₃ ☐ Administrative
- ₄ ☐ Expert accountant
- ₅ ☐ Expert with specialty
- ₆ ☐ Technical studies
- ₇ ☐ Other (specify):_____
- D ☐ Do not know
- R ☐ Does not respond

E2. **Did you study at the technical level to work as a director?**

- ₁ ☐ Yes
- ₀ ☐ No
- D ☐ Do not know
- R ☐ Does not respond

E3. **What is the highest level of education you have completed (from which you had obtained a title)?**

SELECT ONLY ONE ANSWER

- ₁ ☐ Upper secondary
- ₂ ☐ High school teaching degree (PEM) (or technical university) **GO TO E4b**
- ₃ ☐ Bachelor degree in Education (includes pedagogy)
- ₄ ☐ Bachelor degree in another discipline outside of Education
- ₅ ☐ Post graduate (masters, doctorate)
- ₆ ☐ Other post graduate
- ₇ ☐ Other (specify) _____
- D ☐ Do not know
- R ☐ Does not respond

GO TO E4b IF E3=2

E4. **In which year did you receive your highest level of education?**

|___|___|___|___| YEAR   D ☐ Do not know   R ☐ Does not respond

E4a. **Do you have a *profesorado* teaching degree?**

1 ☐ Yes

0 ☐ No   **GO TO E5**

D ☐ Do not know   **GO TO E5**

R ☐ Does not respond   **GO TO E5**

E4b. **What is your specialty in your *profesorado* degree?**

MARK ALL THAT APPLY

1 ☐ Communication

2 ☐ Natural sciences

3 ☐ Biology

4 ☐ Mathematics

5 ☐ Mathematics and physics

6 ☐ Pedagogy

7 ☐ Education administration

8 ☐ Without specialty

9 ☐ Other (specify) _____

D ☐ Do not know

R ☐ Does not respond

E5. **What are your native languages – meaning, the ones you learned to speak at home?**

MARK ALL THAT APPLY. DO NOT READ THE OPTIONS TO THE DIRECTOR. MARK ALL THE OPTIONS THE DIRECTOR INDICATES.

1 ☐ Achi	7 ☐ Spanish	13 ☐ K'iche'	19 ☐ Q'eqchi'	25 ☐ Xinka
2 ☐ Akateko	8 ☐ Garifuna	14 ☐ Mam	20 ☐ Sakapulteko	26 ☐ Other:
3 ☐ Awakateko	9 ☐ Itza'	15 ☐ Mopan	21 ☐ Sipakapense	_____
4 ☐ Chalchiteko	10 ☐ Ixil	16 ☐ Poqomam	22 ☐ Tektiteko	_____
5 ☐ Ch'orti'	11 ☐ Jakalteko-Popti'	17 ☐ Poqomchi'	23 ☐ Tz'utujil	D ☐ Do not know
6 ☐ Chuj	12 ☐ Kaqchikel	18 ☐ Q'anjob'al	24 ☐ Uspanteko	R ☐ Does not respond

E5a. **To which of the following groups do you belong?**

SELECT ONLY ONE OPTION (THE MAIN GROUP)

1 ☐ Ladino

2 ☐ Maya

3 ☐ Garifuna

4 ☐ Xinka

5 ☐ Other (specify) _____

D ☐ Do not know

R ☐ Does not respond

E6. **¿Before working as a director, did you work as a teacher?**

1 ☐ Yes

0 ☐ No

D ☐ Do not know

R ☐ Does not respond

E7. **In which year did you start working as a director at this school?**

|___|___|___|___| YEAR   D ☐ Do not know   R ☐ Does not respond

E8. **How many hours per week do you dedicate to this school (inside and outside of the school)?**

|___|___| HOURS   D ☐ Do not know   R ☐ Does not respond

E9. **In addition to your work at this school, do you have another job or occupation?**

SELECT ONLY ONE ANSWER

1 ☐ Yes

0 ☐ No   **FINISH THE SURVEY**

D ☐ Do not know   **FINISH THE SURVEY**

R ☐ Does not respond   **FINISH THE SURVEY**

E10. **What is your other job or occupation?** MARK ALL THAT APPLY

1 ☐ Director in another school

2 ☐ Teacher in another school

3 ☐ Other (specify): _____

D ☐ Do not know

R ☐ Does not respond

E11. **How many hours per week do you dedicate to your other job?**

|___|___| HOURS   D ☐ Do not know   R ☐ Does not respond

Thank you for your time and for your important support of this study!

REMEMBER TO RECORD THE END TIME OF THE SURVEY ON THE FRONT PAGE

OBSERVATIONS:

MCC Guatemala Threshold Education Project

TEACHER SURVEY
BASELINE MAY 2018

1. SURVEY ID |___|___|___|___|___|___|

2. INTERVIEWER ID: |___|___|

3. SUPERVISOR ID: |___|___|

4. SURVEY DATE: |_D_|_D_| / |_M_|_M_| / |_2_|_0_|_1_|_8_|

5. START TIME: |___|___|: |___|___| 6. END TIME: |___|___|: |___|___|

[RECORD THE TIME IN 24 HOUR FORMAT]

7. SCHOOL NAME: _____

8. SCHOOL CODE: |___|___| - |___|___| - |___|___|___|___| - |_4_|_5_|

8A. VERIFY THE SCHOOL NAME AND CODE AND IF THEY DO NOT CORRESPOND TO THE SAMPLE LIST, PLEASE INCLUDE A NOTE HERE:
_____

9. TEACHER FIRST NAMES: _____

10. TEACHER LAST NAMES: _____

11. DATE OF BIRTH (MM, DD, YEAR): |___|___| / |___|___| / |___|___|___|___|

12. TEACHER GENDER: 1☐ FEMALE   2☐ MALE

13. TEACHER SUBJECT AREA:
   1☐ Mathematics   2☐ Natural sciences   3☐ Communication

14. THE TEACHER COMPLETED OR WILL COMPLETE THE DIRECTOR SURVEY: 1☐ YES   2☐ NO

15. TEACHER PHONE NUMBER: |___|___|___|___|___|___|___|___|

15. SURVEY RESULT:		
1 ☐ Complete	2 ☐ Incomplete	3 ☐ Refused

INFORMED CONSENT

Dear Teacher, my name is _____ [INTERVIEWER NAME] and I am working with the data collection firm, ESPIRALICA. [PRESENT CREDENTIALS]. I am working on a study about education in Guatemala. The study is sponsored by the Millennium Challenge Corporation (MCC), an American federal agency dedicated to international development, and is conducted by Mathematica Policy Research, an American research firm. The Ministry of Education is conducting its own study in the same schools and will visit these schools to collect data using the same teacher survey as well as implementing additional instruments. The Ministry of Education also supports the current study conducted by Mathematica.

The study's goal is to understand teachers' and directors' attitudes; the access to pedagogical support services; professional development activities; pedagogical approaches; and the time dedicated to teaching, administrative, and professional development activities.

We have obtained the permission of the director of this school to interview a few teachers, and we would like to request your collaboration as well. If you agree, we would like to interview you for approximately one hour about your training as a teacher and about your pedagogical practices. We would also like to observe one class period. If you agree to participate, it is likely that we will ask you to participate in a similar survey in 2020 and in a focus group discussion this year, in 2019 and in 2020. In addition, we may ask to observe your class again in 2020.

All the information collected through this survey and classroom observation will be used for statistical purposes only and will be maintained in strict privacy by ESPIRALICA, Mathematica, MCC, DIGEDUCA, and researchers from these organizations with the maximum guarantee permitted under the laws of the United States and Guatemala. The study results will be presented globally in a report and will not include any personal information which could be used to identify you or the school.

Your participation is voluntary and will not affect your work in this school in any way. You may skip any questions that you do not wish to answer or stop the survey at any time without any negative consequences for you or your job. There are no direct benefits from participating in this interview; however, your participation is very important to our study and is part of a larger effort we are making to provide relevant information to help improve education in Guatemala.

You can contact Dr. César Valenzuela (Espirálica's Director) at 4931-9132 (cell phone number in Guatemala); Dr. Catalina Torrente (Researcher at Mathematica) at 001-510-285-4641; or Francisco Ureta (in the Ministry of Education), 2334-0523-ext. 3 if you have questions, concerns, comments or complaints about the study or your rights as a participant.

Please continue to next page ➡

Before we begin, this is the time when you can ask all the questions you have about the study. The most important is for you to understand my work and the collaboration that I expect on your part. Do you have any questions?

[INTERVIEWER: PROVIDE AS COMPLETE RESPONSE AS POSSIBLE]

00. Do you agree to participate in the survey?

₁ ☐ Yes **Please sign here:** [INTERVIEWER: KEEP ONE COPY WITH THE TEACHER'S SIGNATURE AND GIVE HIM/HER A COPY WITHOUT A SIGNATURE]

_____

₀ ☐ No **Thank you!** [INTERVIEWER: END THE SURVEY]

SCHOOL CODE: |____|____| - |____|____| - |____|____|____|____| - | 4 | 5 |

A. SOCIO-DEMOGRAPHIC CHARACTERISTICS

TEACHER EDUCATION

We would like to begin with a few questions related to your education and professional experience.

IF THE TEACHER ALREADY COMPLETED THE DIRECTOR SURVEY, GO TO QUESTION 5.

A1.   What is the highest level of education you have completed (from which you had obtained a title)?

SELECT ONLY ONE ANSWER

1 ☐ Upper Secondary

2 ☐ High school teaching degree (PEM) (or técnico universitario)

3 ☐ Bachelor degree in Education (includes pedagogy)

4 ☐ Bachelor degree in another discipline outside of Education

5 ☐ Post graduate (masters, doctorate)

6 ☐ Other post graduate

7 ☐ Other (specify) _____

D ☐ Do not know

R ☐ Does not respond

→

A2.   In which year did you receive your highest level of education?   GO TO A4 IF A1=2

|___|___|___|___| YEAR   D ☐ Do not know   R ☐ Does not respond

A3.   Do you have a *profesorado* teaching degree?

1 ☐ Yes

0 ☐ No   **GO TO A5**

D ☐ Do not know   **GO TO A5**

R ☐ Does not respond   **GO TO A5**

A4.   What is your specialty in your *profesorado* degree?

MARK ALL THAT APPLY

1 ☐ Communication

2 ☐ Natural sciences

3 ☐ Biology

4 ☐ Mathematics

5 ☐ Mathematics and physics

6 ☐ Pedagogy

7 ☐ Education administration

8 ☐ Without specialty

9 ☐ Other (specify)_____

D ☐ Do not know

R ☐ Does not respond

A5. **Are you studying currently?**

1 ☐ Yes

0 ☐ No   **GO TO A6**

R ☐ Does not respond   **GO TO A6**

A5a. **What are you studying?**

1 ☐ Teaching high school (PEM)

2 ☐ Education administration

3 ☐ Other (specify)_____

D ☐ Do not know

R ☐ Does not respond

TEACHER'S EMPLOYMENT

Now we have a few questions about your employment in this and other schools.

A6. **Prior to the current year, how many years of teaching experience did you have?**

|___|___| YEARS

D ☐ Do not know

R ☐ Does not respond

A7. **Prior to the current year, how many years of teaching experience in this school did you have?**

|___|___| YEARS

D ☐ Do not know

R ☐ Does not respond

A8. **What type of contract do you have?**

SELECT ONLY ONE ANSWER

1 ☐ Fixed contract (rank 011)

2 ☐ Supernumerary (rank 021)

3 ☐ Annual contract (rank 022)

4 ☐ Contract by worked hours

5 ☐ Other? What type? _____

A ☐ Does not apply (Cooperative schools)

D ☐ Do not know

R ☐ Does not respond

A9a. **What are your native languages — meaning, those that you learned to speak at home?**

[SURVEY NOTE: DO NOT READ THE RESPONSES. MARK THE OPTIONS PROVIDED BY THE TEACHER].

MARK ALL THAT APPLY

1 ☐ Achi	7 ☐ Spanish (Castillian)	13 ☐ K'iche'	19 ☐ Q'eqchi'	25 ☐ Xinka
2 ☐ Akateko	8 ☐ Garífuna	14 ☐ Mam	20 ☐ Sakapulteko	26 ☐ Other:
3 ☐ Awakateko	9 ☐ Itza'	15 ☐ Mopan	21 ☐ Sipakapense	_____
4 ☐ Chalchiteko	10 ☐ Ixil	16 ☐ Poqomam	22 ☐ Tektiteko	_____
5 ☐ Ch'orti'	11 ☐ Jakalteko-Popti'	17 ☐ Poqomchi'	23 ☐ Tz'utujil	D ☐ Does not know
6 ☐ Chuj	12 ☐ Kaqchikel	18 ☐ Q'anjob'al	24 ☐ Uspanteko	R ☐ Does not respond

A9b. **To which of the following groups do you belong?**

SELECT ONLY ONE OPTION (THE MAIN GROUP)

1 ☐ Ladino

2 ☐ Maya

3 ☐ Garifuna

4 ☐ Xinka

5 ☐ Other (specify)_____

D ☐ Do not know

R ☐ Does not respond

A10. **Do you teach in a language other than Spanish in this school? (please exclude English as a second language classes)**

SELECT ONLY ONE OPTION

1 ☐ Yes

0 ☐ No

D ☐ Do not know

R ☐ Does not respond

A11a. **What grade levels do you teach at this school?** MARK ALL THAT APPLY

Lower secondary	SECTION A	SECTION B	SECTION C	SECTION D	SECTION E	SECTION F	SECTION G	DOES NOT RESPOND
1 ☐ **7**	|__|	|__|	|__|	|__|	|__|	|__|	|__|	
2 ☐ **8**	|__|	|__|	|__|	|__|	|__|	|__|	|__|	R ☐
3 ☐ **9**	|__|	|__|	|__|	|__|	|__|	|__|	|__|	

A11b. Which of the following subjects do you teach in this school?

MARK ALL THAT APPLY

1 ☐ Mathematics

2 ☐ Natural sciences

3 ☐ Communication

D ☐ Do not know

R ☐ Does not respond

A11c. Without counting the current year, how long have you been teaching in total (in any school and at any grade level)? [CODE FROM THE SUBJECT(S) ON QUESTION A11b]

|___| Subject Code |___|___| YEARS

|___| Subject Code |___|___| YEARS

|___| Subject Code |___|___| YEARS

|___| Subject Code |___|___| YEARS

|___| Subject Code |___|___| YEARS

D ☐ Do not know

R ☐ Does not respond

A11d. Without counting the current year, how long have you been teaching at the lower secondary level?

|___|___| YEARS

D ☐ Do not know

R ☐ Does not respond

A11e. What percentage of the national curriculum do you estimate to have already covered during the current school year?

1 ☐ Mathematics |___|___|___| %

2 ☐ Natural sciences |___|___|___| %

3 ☐ Communication |___|___|___| %

D ☐ Do not know

R ☐ Does not respond

A12. How long are your class periods?

|___|___|___| MINUTES

D ☐ Do not know

R ☐ Does not respond

A13. **Besides your job as a teacher at this school, do you have another job or occupation?**

SELECT ONLY ONE OPTION

1 ☐ Yes

0 ☐ No **GO TO B1**

D ☐ Do not know **GO TO B1**

R ☐ Does not respond **GO TO B1**

A14. **What is your other job or occupation?** MARK ALL THAT APPLY

1 ☐ Director in a different school

2 ☐ Teacher in a different school

3 ☐ Other (specify): _____

D ☐ Do not know

R ☐ Does not respond

A15. **How many hours per week do you devote to your other job?**

|___|___| HOURS

D ☐ Do not know

R ☐ Does not respond

B. TEACHER ABSENCE AND USE OF TIME

We would like to understand how teachers use their time. The following questions ask you to think about which activities you do and the frequency with which you do them. These can be activities that you do at the school or at home.

B1. [INTERVIEWER: RECORD IF THE TEACHER DOES THE ACTIVITY AND IF SO, RECORD THE FREQUENCY]

			How often [ACTIVITY]?								
			Does not do the activity	Daily	Weekly	Monthly	Bimonthly	Semi-annually	Annually	Does not respond	NA
a.	Plan and prepare your classes?	1 □ Yes → 0 □ No R □ DNR	0 □	1 □	2 □	3 □	4 □	5 □	6 □	R □	
b.	Teach the students?	1 □ Yes → 0 □ No R □ DNR	0 □	1 □	2 □	3 □	4 □	5 □	6 □	R □	
c.	Do general maintenance of the classroom (eg., clean, arrange, etc.)?	1 □ Yes → 0 □ No R □ DNR	0 □	1 □	2 □	3 □	4 □	5 □	6 □	R □	
d.	Do general maintenance of the school building, apart from the classroom?	1 □ Yes → 0 □ No R □ DNR	0 □	1 □	2 □	3 □	4 □	5 □	6 □	R □	
e.	Grade exams and student assignments?	1 □ Yes → 0 □ No R □ DNR	0 □	1 □	2 □	3 □	4 □	5 □	6 □	R □	
f.	Participate in meetings with the director and other teachers (of your school)?	1 □ Yes → 0 □ No R □ DNR	0 □	1 □	2 □	3 □	4 □	5 □	6 □	R □	A □
g.	Participate in meetings with parents?	1 □ Yes → 0 □ No R □ DNR	0 □	1 □	2 □	3 □	4 □	5 □	6 □	R □	
h.	Plan and prepare student assessment instruments?	1 □ Yes → 0 □ No R □ DNR	0 □	1 □	2 □	3 □	4 □	5 □	6 □	R □	
	Participate in professional development activities (e.g., training in the teaching of a subject)?	1 □ Yes → 0 □ No R □ DNR	0 □	1 □	2 □	3 □	4 □	5 □	6 □	R □	

			How often [ACTIVITY]?							
			Does not do the activity	Daily	Weekly	Monthly	Bimonthly	Semi-annually	Annually	Does not respond	NA
j.	Provide additional academic support to low performing students outside school hours?	1 □ Yes → 0 □ No R □ DNR 0 □	1 □	2 □	3 □	4 □	5 □	6 □	R □	
k.	Are there other activities that you do as part of your teaching job? Other (specify) _____	1 □ Yes → 0 □ No R □ DNR 0 □	1 □	2 □	3 □	4 □	5 □	6 □	R □	

B2.   Do you plan your lessons?

SELECT ONLY ONE OPTION

1 ☐   Yes

0 ☐   No   **GO TO B4**

D ☐   Do not know   **GO TO B4**

R ☐   Does not respond   **GO TO B4**

B3a.   How often do you plan your lessons?

SELECT ONLY ONE OPTION. DO NOT READ THE OPTIONS.

0 ☐   I do not plan my lessons

1 ☐   Daily

2 ☐   Weekly

3 ☐   Monthly

4 ☐   Bimonthly

5 ☐   Semiannually

6 ☐   Annually

D ☐   Do not know

R ☐   Does not respond

B3b.   When do you plan your lessons?

SELECT ALL THAT APPLY. DO NOT READ THE OPTIONS.

1 ☐   During recess

2 ☐   Outside of class hours, but at the school

3 ☐   Outside of class hours, but at home

4 ☐   Other (specify) _____

D ☐   Do not know

R ☐   Does not respond

B3c.   Some teachers use variety of materials to plan their lessons, while others don't. Do you use any of the following materials to plan your lessons?

READ THE ITEMS AND MARK TEACHER'S RESPONSES

1 ☐   The national curriculum (CNB)

2 ☐   Indicators of achievement

3 ☐   Teacher guides

4 ☐   Textbooks

5 ☐   Internet for information search (e.g. interactive games)

6 ☐   Facilitator/teacher planner

7 ☐   Assessment tools

8 ☐   **Do you use any other materials to plan lessons?** (specify)
        _____

9 ☐   None [MARK WITHOUT ASKING IF THE TEACHER DOES NOT USE ANY OF THE ABOVE]

D ☐   Do not know

R ☐   Does not respond

B4. **From the following ítems, which two would help you increase the time you devote to teaching students?**

MARK THE MOST IMPORTANT TWO BUT REMEMBER THAT YOU CAN ALSO MARK ONLY ONE

1 ☐ School infrastructure improvements (for example, better lighting, more comfortable seating)

2 ☐ Fewer meetings during the school day

3 ☐ Extend the school day

4 ☐ Support from other teachers to develop lesson plans

5 ☐ Support from the school director

6 ☐ More structured lesson plans, guides and/or materials

7 ☐ Support from parents

8 ☐ Technology in the classroom

9 ☐ Other (specify one) _____

10 ☐ Other (specify one)_____

D ☐ Do not know

R ☐ Does not respond

Now, I would like to ask you about absences from school.

B5. **We understand that sometimes teachers need to be absent from school for various reasons. How many days did you have to be absent from school during the last 30 days?**

|___|___| DAYS   **IF THE # OF DAYS = 0, MARK 0 AND GO TO C1**

D ☐ Do not know   **GO TO C1**

R ☐ Does not respond   **GO TO C1**

B6. **During the days on which you were unable to teach during the past month, did another teacher substitute in your classes?**

1 ☐ Yes

0 ☐ No   **GO TO C1**

D ☐ Do not know   **GO TO C1**

R ☐ Does not respond   **GO TO C1**

B7. **How many days did the other teacher substitute?**

|___|___| DAYS

D ☐ Do not know

R ☐ Does not respond

C. TEACHER USE OF ASSESSMENTS AND PEDAGOGICAL INNOVATIONS

Next, we want to learn more about how you assess your students' performance in the classroom.

C1. **Do you use tests or assessments in the classroom to determine if students understand the information that you are teaching?**

- 1 ☐ Yes
- 0 ☐ No   **GO TO C3**
- D ☐ Do not know   **GO TO C3**
- R ☐ Does not respond   **GO TO C3**

C1a. **What type of assessment tools do you use with your students?** [INTERVIEWER NOTE – DO NOT READ THE OPTIONS]

MARK ALL THAT APPLY

- 1 ☐ Objective tests
- 2 ☐ Rubrics
- 3 ☐ Grading scales
- 4 ☐ Checklists
- 5 ☐ Portfolio
- 6 ☐ Conceptual maps
- 7 ☐ Projects
- 8 ☐ Parallel text
- 9 ☐ Self-assessments
- 10 ☐ Work sheets
- 11 ☐ Other (specify) _____
- D ☐ Do not know
- R ☐ Does not respond

C1b. **How often do you test or assess your students?**

SELECT ONLY ONE OPTION

- 1 ☐ Daily
- 2 ☐ Weekly
- 3 ☐ Monthly
- 4 ☐ Bimonthly
- 5 ☐ Semiannually
- 6 ☐ Annually
- D ☐ Do not know
- R ☐ Does not respond

C1c. **How often do you provide feedback to your students?**

SELECT ONLY ONE OPTION

- 0 ☐ Do not provide feedback to students
- 1 ☐ Daily
- 2 ☐ Weekly
- 3 ☐ Monthly
- 4 ☐ Bimonthly
- 5 ☐ Semiannually
- 6 ☐ Annually
- D ☐ Do not know
- R ☐ Does not respond

C2. **What do you use the information that you gather from tests and assessments for?** [DO NOT READ THE OPTIONS]

MARK ALL THAT APPLY

- 1 ☐ To give grades to each student (to inform parents)
- 2 ☐ To plan lessons based on the level of knowledge in the class
- 3 ☐ To identify students who may need individual attention
- 4 ☐ Other (specify) _____
- D ☐ Do not know
- R ☐ Does not respond

Next, I would like to focus on the strategies that you use in your classes to help students learn. Think only about communication, natural sciences, or math classes.

		How often [READ THE STRATEGY] **in your classes?**							
		Daily	Weekly	Monthly	Bimonthly	Biannually	Annually	DK	DNR
C3. Do you conduct class-wide discussions to work on a reading or a problem?	1 ☐ Yes → 0 ☐ No R ☐ DNR	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
C4. Do you organize small groups to work on a reading or a problem?	1 ☐ Yes → 0 ☐ No R ☐ DNR	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
C5. Do you organize group topic discussions based on a reading or a problem?	1 ☐ Yes → 0 ☐ No R ☐ DNR	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
C6. Do you solicit student comments on a topic?	1 ☐ Yes → 0 ☐ No R ☐ DNR	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
C7. Do students develop projects and presentations to reinforce what they learned?	1 ☐ Yes → 0 ☐ No R ☐ DNR	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
C8. Do you use the board to present information to students?	1 ☐ Yes → 0 ☐ No R ☐ DNR	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
C9. Do you ask students to write short responses to questions?	1 ☐ Yes → 0 ☐ No R ☐ DNR	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
C10. Do you use tests or exams to determine student understanding?	1 ☐ Yes → 0 ☐ No R ☐ DNR	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
C11. Do you ask students to review peer student homework or assignments?	1 ☐ Yes → 0 ☐ No R ☐ DNR	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
C12. Do you allow students to work directly with the material? (any material)	1 ☐ Yes → 0 ☐ No R ☐ DNR	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
C13. Do you pause <u>during lecture</u> to encourage students to participate actively?	1 ☐ Yes → 0 ☐ No R ☐ DNR	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
C14. Do you allow students to decide whether to answer a question or not?	1 ☐ Yes → 0 ☐ No R ☐ DNR	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐

		How often [READ THE STRATEGY] in your classes?							
		Daily	Weekly	Monthly	Bimonthly	Biannually	Annually	DK	DNR
C15. Do you randomly select students to respond to questions, regardless of whether they know the answer or not?	1 ☐ Yes → 0 ☐ No R ☐ DNR	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
C16. Do you integrate classroom knowledge with real-world situations and actions?	1 ☐ Yes → 0 ☐ No R ☐ DNR	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
C17. Do you use technology and audio-visual aids, such as interactive boards or PowerPoint presentations in the classroom?	1 ☐ Yes → 0 ☐ No R ☐ DNR	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
C18. Do you use online media in the classroom?	1 ☐ Yes → 0 ☐ No R ☐ DNR	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
C19. Do students work independently in the classroom?	1 ☐ Yes → 0 ☐ No R ☐ DNR	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
C20. Do students read books or magazines in the classroom?	1 ☐ Yes → 0 ☐ No R ☐ DNR	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
C21. Do students do homework at home?	1 ☐ Yes → 0 ☐ No R ☐ DNR	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
C22. Do you practice inclusive education (adjust your lesson plans to cover the needs of all your students so that they can participate on equal conditions)?	1 ☐ Yes → 0 ☐ No R ☐ DNR	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
C23. Do you conduct extra-curricular activities with your students? For example, sports, visits to businesses, museums, or other sites outside of the school.	1 ☐ Yes → 0 ☐ No R ☐ DNR	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐

D. TEACHER PROFESSIONAL DEVELOPMENT AND TRAINING

Now I have a few questions related to the type of training or professional development that you received last year.

D1. **Did you participated in any training or professional development activities last year (2017)? (it does not need to be on the subject you teach)**

    1 ☐   Yes

    0 ☐   No   **GO TO D2**

    D ☐   Do not know   **GO TO D2**

    R ☐   Does not respond   **GO TO D2**

D1a. **In how many training or professional development activities did you participate? If you do not recall the exact number, you can provide an estimate.**

    |___|___|

    D ☐   Do not know

    R ☐   Does not respond

D1b. **In the training that you received, did they cover any of the following topics?**

INTERVIEWER NOTE: SHOW THE LAMINATED CARD TO THE TEACHER, READ EACH ITEM, AND MARK ONLY ONE RESPONSE PER ROW	YES	NO	DOES NOT KNOW	DOES NOT RESPOND
a. Information and communications technology (ICT)	1 ☐	0 ☐	D ☐	R ☐
b. Active pedagogy strategies	1 ☐	0 ☐	D ☐	R ☐
c. Content for a specific subject (for example, math, natural sciences and technology, communication)	1 ☐	0 ☐	D ☐	R ☐
d. Training in transition from lower to upper secondary	1 ☐	0 ☐	D ☐	R ☐
e. Professional orientation	1 ☐	0 ☐	D ☐	R ☐
f. Gender equality	1 ☐	0 ☐	D ☐	R ☐
g. Developing soft skills in students, such as problem solving, communication, teamwork, time management, responsibility, leadership skills	1 ☐	0 ☐	D ☐	R ☐
h. Education inclusion	1 ☐	0 ☐	D ☐	R ☐
i. Leadership	1 ☐	0 ☐	D ☐	R ☐
j. Curriculum development	1 ☐	0 ☐	D ☐	R ☐
k. Community participation	1 ☐	0 ☐	D ☐	R ☐
l. Use of the national curriculum (CNB)	1 ☐	0 ☐	D ☐	R ☐
m. Alternancia[55]	1 ☐	0 ☐	D ☐	R ☐
n. Were other topics covered? (specify): _____	1 ☐	0 ☐	D ☐	R ☐

---

[55] Alternancia is a modality where students take lessons in the classroom but continue learning outside of the classroom in real-world settings such as the farm.

	Topics (RECORD THE CODES FROM THE ABOVE LIST)	D1c. What is the name of the institution that conducted the training on [TOPIC]? Think about the 5 more recent trainings.
1	|___| Topic code (a-n)	|___| Institution code
2	|___| Topic code (a-n)	|___| Institution code
3	|___| Topic code (a-n)	|___| Institution code
4	|___| Topic code (a-n)	|___| Institution code
5	|___| Topic code (a-n)	|___| Institution code

INSTITUTION CODES FOR D1c:

1. Ministry of Education
2. FHI 360
3. Administrative technical coordination
4. Telefónica Foundation
5. San Carlos University of Guatemala
6. Other (specify) _____
7. Other (specify) _____
D. Do not know
R. Does not respond

D2. **Did you receive pedagogical support in 2017?**

1. ☐ Yes

0. ☐ No **GO TO D3**

D. ☐ Do not know **GO TO D3**

R. ☐ Does not respond **GO TO D3**

D2a. **How many times did you receive pedagogical support in 2017?**

|___|___|

D. ☐ Do not know

R. ☐ Does not respond

D2b. **Who conducted the pedagogical support?** [INTERVIEWER NOTE: DO NOT READ THE OPTIONS]

MARK ALL THAT APPLY

1 ☐ The Ministry of Education

2 ☐ FHI 360

3 ☐ Other (specify) _____

D ☐ Do not know

R ☐ Does not respond

D3. **Learning community refers to a strategy for continual teacher training, in which teachers work together and support each other to improve educational practices. Do you participate in a formal or informal learning community with other teachers?**

1 ☐ Yes

0 ☐ No **GO TO D4**

D ☐ Do not know **GO TO D4**

R ☐ Does not respond **GO TO D4**

D3a. **How often do you participate in this learning community?**

SELECT ONLY ONE OPTION

1 ☐ Daily

2 ☐ Weekly

3 ☐ Monthly

4 ☐ Bimonthly

5 ☐ Semiannually

6 ☐ Annually

D ☐ Do not know

R ☐ Does not respond

D4. **In your opinion, of the following aspects, which are the three that can best help your students continue their studies and advance to higher education levels?**

[INTERVIEWER: SHOW THE LAMINATED CARD TO THE TEACHER AND READ ALL THE ITEMS ALOUD. MARK THE THREE MOST IMPORTANT ASPECTS BUT REMEMBER THAT YOU CAN MARK LESS THAN 3]

1 ☐ Extracurricular activities

2 ☐ Education materials

3 ☐ Provide nutrition

4 ☐ Help with school tasks outside of class

5 ☐ Support from parents at home

6 ☐ Tutoring and classes to even out and reinforce knowledge during the school year

7 ☐ Developing soft skills in students, such as problem solving, communication, teamwork, time management, responsibility, leadership skills

8 ☐ Secure school environment

9 ☐ Other (specify) _____

D ☐ Do not know

R ☐ Does not respond

D5. **Of the following aspects, which are the three that can best help students make the transition to the workforce?**

[INTERVIEWER: READ ALL THE ITEMS TO THE TEACHER, SHOW HIM/HER THE LAMINATED CARD, AND MARK THE THREE MOST IMPORTANT ASPECTS]

1 ☐ Professional orientation

2 ☐ Organizing extracurricular activities

3 ☐ Tutoring and classes to even out and reinforce knowledge during the school year

4 ☐ Developing soft skills in students (for example, problem solving, communication, teamwork, time management, responsibility, leadership skills)

5 ☐ Vocational and occupational training (for example, automotive mechanics, carpentry, textile work, baking, tourism, etc.)

6 ☐ Productive projects

7 ☐ Link to work or entrepreneurship sources

8 ☐ Other (specify) _____

D ☐ Do not know

R ☐ Does not respond

E. PERCEPTIONS ABOUT GENDER EQUALITY

E1. **Next, I will read a few statements to you related to the role that boys and girls play in society. Different people have different opinions on these topics and we are interested to hear your opinion. For each statement, please choose the option that indicates how strongly you agree or disagree with it. There are no right or wrong responses for these statements.** [SHOW THE TEACHER THE LAMINATED CARD] **The response options are: Disagree strongly, Disagree somewhat, Agree somewhat, Agree strongly.**

INTERVIEWER: READ EACH STATEMENT AND MARK ONLY ONE RESPONSE PER ROW

	DISAGREE STRONGLY	DISAGREE SOMEWHAT	AGREE SOMEWHAT	AGREE STRONGLY	DO NOT KNOW	DOES NOT RESPOND
a. Girls have the same right to go to school as boys.	1 ☐	2 ☐	3 ☐	4 ☐	D ☐	R ☐
b. Girls can succeed in math and science.	1 ☐	2 ☐	3 ☐	4 ☐	D ☐	R ☐
c. Girls and boys have the same opportunity to take math and science classes.	1 ☐	2 ☐	3 ☐	4 ☐	D ☐	R ☐
d. Teachers at my school encourage boys and girls to participate during math and science classes.	1 ☐	2 ☐	3 ☐	4 ☐	D ☐	R ☐
e. Girls and boys participate equally in discussions in my classroom.	1 ☐	2 ☐	3 ☐	4 ☐	D ☐	R ☐
f. A female president can be as effective as a male president.	1 ☐	2 ☐	3 ☐	4 ☐	D ☐	R ☐

F. SCHOOL ENVIRONMENT

The next questions relate to the school environment. We will begin with a few questions about your classroom.

F1.   **Are there sufficient materials or resources in your classroom to support instruction?**

    1 ☐ Yes   **GO TO F2**

    0 ☐ No

    D ☐ Do not know

    R ☐ Does not respond

F1a.   **What teaching materials do you lack?**

[INTERVIEWER): DO NOT READ THE RESPONSE OPTIONS TO THE TEACHER. MARK ALL THAT APPLY AND NOTE OTHER SPECIFY]

    1 ☐ Blackboard/whiteboard

    2 ☐ Chalk

    3 ☐ Teacher desk

    4 ☐ Notebooks/paper

    5 ☐ Hands-on materials (maps, graphics, photos, posters, flipcharts, slides, compasses, coins, blocks, cards, sticks)

    6 ☐ Textbooks

    7 ☐ Computers

    8 ☐ Projector

    9 ☐ Teaching guides

    10 ☐ Recorders

    11 ☐ DVD/VHS/Television

    12 ☐ Cardboard, markers, pencils, pens, crayons

    13 ☐ Internet

    14 ☐ Other (specify) _____

    D ☐ Do not know

    R ☐ Does not respond

F2. **Now we would like to ask you about the conditions in your classroom that may facilitate or impede your ability to teach. For the following potential problems, please indicate if this is a problem that impacts your classroom, or not.**

Condition	IMPACTS THE CLASSROOM	DOES NOT IMPACT THE CLASSROOM	DO NOT KNOW	DOES NOT RESPOND
a. Lack of desks and chairs in good condition for all students	1 ☐	0 ☐	D ☐	R ☐
b. Insufficient lighting (there isn't sufficient light)	1 ☐	0 ☐	D ☐	R ☐
c. Problems related to ventilation and temperature (too hot or too cold)	1 ☐	0 ☐	D ☐	R ☐
d. Exterior noise	1 ☐	0 ☐	D ☐	R ☐
e. Interior noise	1 ☐	0 ☐	D ☐	R ☐
f. Presence of smoke, dust, or contaminants	1 ☐	0 ☐	D ☐	R ☐

F3.   At this school...

…is there access to…		F4. How often do you use [resource] **in your classroom?**								
		Do not use	Daily	Weekly	Monthly	Bimonthly	Biannually	Annually	DK	DNR
a. Sports field ?	1 ☐ Yes⟶ 0 ☐ No R ☐ DNR	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
b. Garden?	1 ☐ Yes⟶ 0 ☐ No R ☐ DNR	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
c. Manual arts workshop?	1 ☐ Yes⟶ 0 ☐ No R ☐ DNR	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
d. Library?	1 ☐ Yes⟶ 0 ☐ No R ☐ DNR	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
e. Science lab?	1 ☐ Yes⟶ 0 ☐ No R ☐ DNR	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
f. Computer lab ?	1 ☐ Yes⟶ 0 ☐ No R ☐ DNR	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
g. Internet service for students to use ?	1 ☐ Yes⟶ 0 ☐ No R ☐ DNR	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
h. Projectors?	1 ☐ Yes⟶ 0 ☐ No R ☐ DNR	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐
i. DVD/VHS player?	1 ☐ Yes⟶ 0 ☐ No R ☐ DNR	0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	D ☐	R ☐

G. INFORMATION ABOUT THE WORK AND THE HOUSEHOLD OF THE TEACHER

Now we have a few questions about your work and household.

G1. **How do you obtain the water used for washing or in the bathroom?**

SELECT ONLY ONE ANSWER (THE MAJOR SOURCE)

- 1 ☐ Natural source (river, spring, lake, community well, rainwater)
- 2 ☐ Public tap (administered by the municipality)
- 3 ☐ Plumbing (municipal system, does not include water from a natural source that is piped)
- 4 ☐ Purchased
- 5 ☐ Other (specify) _____
- D ☐ Do not know
- R ☐ Does not respond

G2. **Do you have electricity at home?**

SELECT ONLY ONE ANSWER

- 1 ☐ Yes
- 0 ☐ No
- D ☐ Do not know
- R ☐ Does not respond

G3. **What type of toilet do you have at home?**

SELECT ONLY ONE ANSWER. TRY TO USE THE OPTIONS GIVEN

- 1 ☐ Does not have
- 2 ☐ Toilet connected to septic tank or drainage network
- 3 ☐ Washable toilet
- 4 ☐ Latrine or well
- 5 ☐ Other (specify)
- D ☐ Do not know
- R ☐ Does not respond

G4. **Do you have internet service at home?**

- 1 ☐ Yes
- 0 ☐ No   **GO TO G6**
- D ☐ Do not know   **GO TO G6**
- R ☐ Does not respond **GO TO G6**

G5. **What type of internet service do you have at home?**

SELECT ONLY ONE ANSWER

1 ☐ Residential internet service

2 ☐ Pre-paid recharging service

3 ☐ Other (specify) _____

D ☐ Do not know

R ☐ Does not respond

G6. **Do you have internet service on your phone?**

1 ☐ Yes

0 ☐ No

D ☐ Do not know

R ☐ Does not respond

G7. **The house where you live is:**

SELECT ONLY ONE ANSWER

1 ☐ Owned?

2 ☐ Rented?

3 ☐ Loaned?

4 ☐ Other (specify) _____

D ☐ Do not know

R ☐ Does not respond

G8. **How many members are there in your household? (including yourself)**

|___|___| MEMBERS

D ☐ Do not know

R ☐ Does not respond

G9. **How many rooms are there in your household? Exclude the ones used for the kitchen, bathroom, hallways, garages, or dedicated to business.**

|___|___| ROOMS

D ☐ Do not know

R ☐ Does not respond

G10.   Does your household have…

	NO	YES	DO NOT KNOW	DID NOT RESPOND
1. Gas or electric stove?	0 ☐	1 ☐	D ☐	R ☐
2. Refrigerator?	0 ☐	1 ☐	D ☐	R ☐
3. Mixer?	0 ☐	1 ☐	D ☐	R ☐
4. Electric iron?	0 ☐	1 ☐	D ☐	R ☐
5. Mobile phone service?	0 ☐	1 ☐	D ☐	R ☐
6. Television? **If no – Go to 8**	0 ☐	1 ☐	D ☐	R ☐
7. Cable television service?	0 ☐	1 ☐	D ☐	R ☐
8. Dryer?	0 ☐	1 ☐	D ☐	R ☐
9. Stereo or sound equipment?	0 ☐	1 ☐	D ☐	R ☐
10. Vhs/dvd?	0 ☐	1 ☐	D ☐	R ☐
11. Washing machine?	0 ☐	1 ☐	D ☐	R ☐
12. Microwave?	0 ☐	1 ☐	D ☐	R ☐
13. Computer?	0 ☐	1 ☐	D ☐	R ☐
14. Video game console?	0 ☐	1 ☐	D ☐	R ☐
15. Bicycle?	0 ☐	1 ☐	D ☐	R ☐
16. Motorcycle or scooter?	0 ☐	1 ☐	D ☐	R ☐
17. Automobile (such as a sedan, pick up, truck)?	0 ☐	1 ☐	D ☐	R ☐

G11. **What is the main material of the floors in your home?**
SELECT ONLY ONE OPTION

1 ☐ Soil

2 ☐ Unfinished wood

3 ☐ Cement

4 ☐ Ceramic

5 ☐ Finished wood

6 ☐ Other (specify) _____

D ☐ Do not know

R ☐ Does not respond

G12. **What is the main material of the walls in your home?**
SELECT ONLY ONE OPTION

1 ☐ Unfinished wood

2 ☐ Adobe

3 ☐ Sheeting (e.g. corrugated metal)

4 ☐ Cement block

5 ☐ Brick

6 ☐ Finished wood

7 ☐ Bajareque (mixture of adobe with straw and/or cane)

8 ☐ Lepa (cutting from tree trunk for construction material)

9 ☐ Other (specify) _____

D ☐ Do not know

R ☐ Does not respond

G13 **What is the main material of the ceiling in your home?**
SELECT ONLY ONE OPTION

1 ☐ Perishable or fragile material (straw, palm, or similar)

2 ☐ Corrugated metal sheeting

3 ☐ Asbestos sheeting (for example, Duralite)

4 ☐ Roofing tile

5 ☐ PVC tile

6 ☐ Concrete tiles

7 ☐ Other (specify) _____

D ☐ Do not know

R ☐ Does not respond

G14. **Does your family receive remittances from abroad?**
SELECT ONLY ONE OPTION

1 ☐ Yes

0 ☐ No

D ☐ Do not know

R ☐ Does not respond

H. CLASS ATTENDANCE
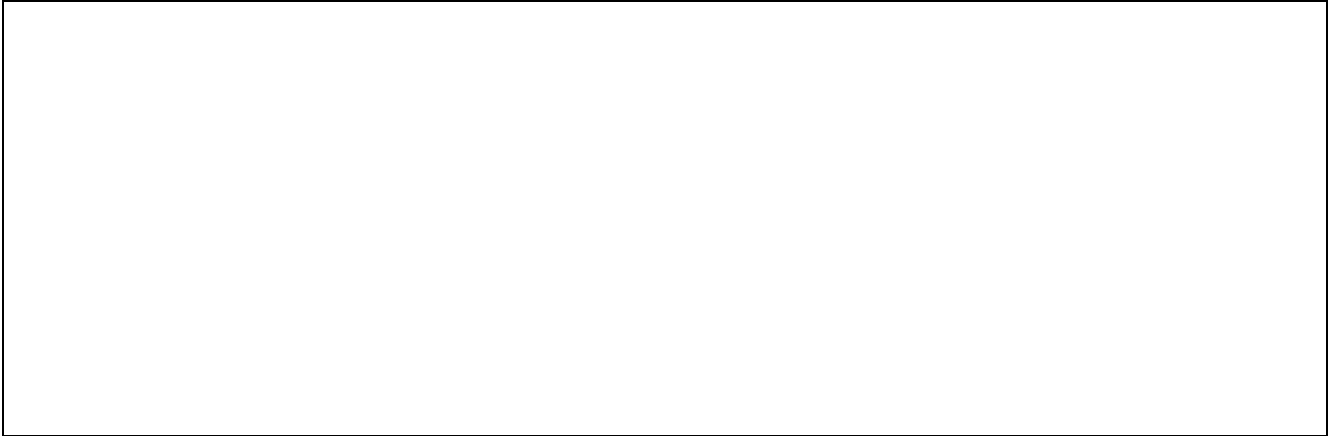
Now I would like to ask for your attendance books to verify the student attendance in your classroom. We will focus on the two weeks prior to today, meaning, the weeks of DAY **of** MONTH **and of** DAY **of** MONTH**.** [IF THE TEACHER TEACHES MORE THAN ONE SECTION, IT IS ONLY NECESSARY TO COMPLETE THE INFORMATION FOR THE SECTION THAT WE WILL OBSERVE. RECORD THE DATE IN THE FOLLOWING FORMAT: DD / MM.]

		RECORD THE DATE (DD/MM)	ENROLLED STUDENTS		ATTENDANCE				
			How many girls are enrolled?	How many boys are enrolled?	How many girls were attending on the day…	How many boys were attending on the day…	THERE WAS NO CLASS	DK (OR THERE IS NO RECORD)	DNR
Week 1	Monday	__|__/|__|__|	|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|	A ☐	D ☐	R ☐
	Tuesday	__|__/|__|__|	DO NOT KNOW D ☐	DO NOT KNOW D ☐	|__|__|__|	|__|__|__|	A ☐	D ☐	R ☐
	Wednesday	__|__/|__|__|	DOES NOT RESPOND R ☐	DOES NOT RESPOND R ☐	|__|__|__|	|__|__|__|	A ☐	D ☐	R ☐
	Thursday	__|__/|__|__|			|__|__|__|	|__|__|__|	A ☐	D ☐	R ☐
	Friday	__|__/|__|__|			|__|__|__|	|__|__|__|	A ☐	D ☐	R ☐
Week 2	Monday	__|__/|__|__|	|__|__|__|	|__|__|__|	|__|__|__|	|__|__|__|	A ☐	D ☐	R ☐
	Tuesday	__|__/|__|__|	DO NOT KNOW D ☐	DO NOT KNOW D ☐	|__|__|__|	|__|__|__|	A ☐	D ☐	R ☐
	Wednesday	__|__/|__|__|	DOES NOT RESPOND R ☐	DOES NOT RESPOND R ☐	|__|__|__|	|__|__|__|	A ☐	D ☐	R ☐
	Thursday	__|__/|__|__|			|__|__|__|	|__|__|__|	A ☐	D ☐	R ☐
	Friday	__|__/|__|__|			|__|__|__|	|__|__|__|	A ☐	D ☐	R ☐

Thank you for your time and for your important support of this study!

REMEMBER TO RECORD THE END TIME OF THE SURVEY ON THE FRONT PAGE

OBSERVATIONS

MCC Guatemala Threshold Education Project

STALLINGS SNAPSHOT OBSERVATION
BASELINE MAY 2018

A. SCHOOL INFORMATION:

1. OBSERVER ID: |___|___|___|___|___|

2. OBSERVATION DATE: |___|___| / |___|___| / | 2 | 0 | 1 | 8 |

3. SCHOOL NAME:_____

4. SCHOOL CODE: |__|__| - |__|__| - |__|__|__|__| - | 4 | 5 |

5. TEACHER FIRST NAMES: _____

6. TEACHER LAST NAMES: _____

7. TEACHER NATIONAL ID: |___|___|___|___|___|___|___|___|___|___|___|___|___|

8. SCHOOL DEPARTMENT: Alta Verapaz / Chiquimula / Jalapa / Sacatepéquez / Sololá

9. SELECT THE SHIFT OBSERVED: Morning / Afternoon / Evening / Double

10. SELECT THE CLASS OBSERVED: Mathematics / Natural sciences / Communication

11. SELECT THE GRADE OBSERVED: 7th / 8th / 9th

12. SELECT THE SECTION OBSERVED: A / B / C / D / E / F / G / Single

13. HOW MANY BOYS ARE THERE IN THE CLASS? |__|__|

14. HOW MANY GIRLS ARE THERE IN THE CLASS? |__|__|

15. TOTAL NUMBER OF STUDENTS: |__|__|__| (CALCULATE THE TOTAL AUTOMATICALLY)

16. WHAT IS THE OFFICIAL START OF THE CLASS? |__|__| : |__|__|

17. AT WHAT TIME DID THE CLASS START? |__|__| : |__|__|

   [MENU AVAILABLE IN 24 HOUR FORMAT, TO REGISTER HOURS AND MINUTES]

B. OBSERVATION SNAPSHOTS

1. **Register the observation snapshot start time**

   |___|___| : |___|___|

   [MENU AVAILABLE IN 24 HOUR FORMAT, TO REGISTER HOURS AND MINUTES]

2. **Describe briefly what you observed during the 15 seconds observation snapshot**

   _____

   [ALPHA-NUMERIC OPEN FIELD TO REGISTER THE INITIAL DESCRIPTION]

3. **What is the teacher doing?**

   SELECT ONLY ONE

   1 ☐ Reading out loud
   2 ☐ Lecturing or Class instruction/Demonstration
   3 ☐ Discussion/Debate/Questions and Answers
   4 ☐ Memorization/ Learning by repetition
   5 ☐ Individual class assignment / Class work   **GO TO 6**
   6 ☐ Copying   **GO TO 6**
   7 ☐ Social interaction (with students)   **GO TO 7**
   8 ☐ Discipline   **GO TO 7**
   9 ☐ Classroom management with students' help   **GO TO 7**
   10 ☐ Classroom management alone   **GO TO 8**
   11 ☐ Teacher in social interaction (with other adult) / Teacher not involved   **GO TO 8**
   12 ☐ Teacher out of the classroom   **GO TO 8**

4. **Is the activity cooperative? (students work in groups to produce a shared product)**

   [THIS QUESTION WILL SHOW IF ONE OF OPTIONS 1-4 ABOUT TEACHER'S ACTIVITY ON QUESTION 3 WAS SELECTED]

   1 ☐ Yes
   0 ☐ No   **GO TO 6**

5. **Is the activity done in a group? (students interact in groups using academic material but each one of them produces an individual product)**

   [THIS QUESTION WILL SHOW IF ONE OF OPTIONS 1-4 ABOUT TEACHER'S ACTIVITY ON QUESTION 3 WAS SELECTED AND IF THE ACTIVITY IS NOT COOPERATIVE]

   1 ☐ Yes
   0 ☐ No

6. **What material is the teacher using for the activity?**

SELECT ONLY ONE

1 ☐ No material
2 ☐ Textbook
3 ☐ Notebook
4 ☐ Blackboard
5 ☐ Learning aids
6 ☐ Information, communication and technology (ICT)
7 ☐ Laboratory equipment or material

7. **How many students are involved in the activity with the teacher?**

SELECT ONLY ONE. IF THE ANSWER IS EVERYONE, GO TO THE NEXT OBSERVATION SNAPSHOT

1 ☐ One student
2 ☐ Small group (2-5 students)
3 ☐ Large group (6 or more students)
4 ☐ Everyone

8. **What are the students who are NOT engaged with the teacher doing?**

[THIS QUESTION WILL SHOW IF THERE IS ONE OR MORE THAN ONE STUDENT (SMALL OR LARGE GROUP) WHO IS/ ARE NOT INVOLVED IN THE ACTIVITY WITH THE TEACHER]
MARK ALL THAT APPLY

1 ☐ Reading out loud
2 ☐ Lecturing or Class instruction/Demonstration
3 ☐ Discussion/Debate/Questions and Answers
4 ☐ Memorization/ Learning by repetition
5 ☐ Individual class assignment / Class work   **GO TO 11**
6 ☐ Copying   **GO TO 11**
7 ☐ Social interaction (among students)   **GO TO 12**
8 ☐ Classroom management with students' help   **GO TO 12**
9 ☐ Student not involved   **GO TO 12**

9. **Is the activity _____** *[INSERT TYPE OF ACTIVITY (1 – 4) REGISTERED ON QUESTION #8]* cooperative? (students work in groups to produce a shared product)

[THIS QUESTION REPEATS FOR EACH ACTIVITY (1-4) REGISTERED ON QUESTION #8]

1 ☐ Yes
0 ☐ No   **GO TO B11**

10. **Is the activity _____** *[INSERT TYPE OF ACTIVITY (1 – 4) REGISTERED ON QUESTION #8]* done in a group? (students interact in groups using academic material but each one of them produces an individual product)

[THIS QUESTION REPEATS FOR EACH ACTIVITY (1-4) REGISTERED ON QUESTION #8 THAT IS NOT COOPERATIVE]

1 ☐ Yes

0 ☐ No

11. **What material are using the students who are_____** *[INSERT TYPE OF ACTIVITY (1 – 6) REGISTERED ON QUESTION #8]*?

[THIS QUESTION REPEATS FOR EACH ONE OF THE ACTIVITY (1-6) REGISTERED ON QUESTION #8]

MARK THE MAIN MATERIAL ONLY

1 ☐ No material

2 ☐ Textbook

3 ☐ Notebook

4 ☐ Blackboard

5 ☐ Learning aids

6 ☐ Information, communication and technology (ICT)

7 ☐ Laboratory equipment or material

12. **How many students participate in _____** *[INSERT TYPE OF ACTIVITY (1 – 9) REGISTERED ON QUESTION #8]*?

[THIS QUESTION REPEATS FOR EACH ONE OF THE ACTIVITY (1-9) REGISTERED ON QUESTION #8]

SELECT ONLY ONE

1 ☐ One student

2 ☐ Small group (2-5 students)

3 ☐ Large group (6 or more students)

4 ☐ Everyone

[BEFORE THE START OF THE 10TH OBSERVATION SNAPSHOT, INSERT THE FOLLOWING QUESTION]

How many boys are present in the class? |__|__|

How many girls are present in the class? |__|__|

Total number of students: |__|__|__| [CALCULATE THE TOTAL AUTOMATICALLY]

When did the class end? |__|__| : |__|__|

[MENU AVAILABLE IN 24 HOUR FORMAT, TO REGISTER HOURS AND MINUTES]

C. OBSERVATIONS ABOUT THE BEHAVIOR / COMPETENCIES OF TEACHER AND STUDENTS

1. AFTER THE LAST OBSERVATION SNAPSHOT, PLEASE RATE EACH OF THE FOLLOWING STATEMENTS ON TEACHER BEHAVIORS ON THE SCALE FROM 1 TO 3. CHECK ONLY ONE RATING FOR EACH STATEMENT. IF YOU DID NOT OBSERVE THE BEHAVIOR DURING THE OBSERVATION TIME, CHECK "DID NOT OBSERVE."

ASSESSMENT SCALE:

POORLY: THE TEACHER DEMONSTRATES THE COMPETENCY LESS THAN 50 PERCENT OF THE CLASS PERIOD

SOMEWHAT WELL: THE TEACHER DEMONSTRATES THE COMPETENCY BETWEEN 50 AND 89 PERCENT OF THE CLASS PERIOD

VERY WELL: THE TEACHER DEMONSTRATES THE COMPETENCY BETWEEN 90 AND 100 PERCENT OF THE CLASS PERIOD

THE TEACHER:	POORLY	SOMEWHAT WELL	VERY WELL	NOT OBSERVED
a. Manages instructional time effectively.	1 ☐	2 ☐	3 ☐	0 ☐
b. Demonstrates effective class management abilities (i.e., cold calls students, transitions between topics without losing time; keeps all students engaged during the class period).	1 ☐	2 ☐	3 ☐	0 ☐
c. Makes effective use of different instructional resources and strategies to explain subject matter concepts and skills. (e.g., visual, auditory, kinesthetic approaches; uses learning support materials).	1 ☐	2 ☐	3 ☐	0 ☐
d. Engages students in carefully structured active learning and cooperative experiences. (e.g., project-based learning, presentations).	1 ☐	2 ☐	3 ☐	0 ☐
e. Actively ensures the participation of all students in learning activities irrespective of their sex, achievement level, special needs, giftedness and other differences (e.g., cold calls unengaged students).	1 ☐	2 ☐	3 ☐	0 ☐
f. Effectively asks probing and open-ended questions that encourage thinking, and help students engage in discussion.	1 ☐	2 ☐	3 ☐	0 ☐
g. Provides students with opportunities to build meaningful connections between different subject matter areas, and between these areas and everyday life experiences (e.g., gives examples of how content is related to student's reality).	1 ☐	2 ☐	3 ☐	0 ☐
h. Provides students with structured opportunities to apply their understandings and skills to everyday life situations and problems.	1 ☐	2 ☐	3 ☐	0 ☐
i. Provides students with structured opportunities to reflect on their own learning.	1 ☐	2 ☐	3 ☐	0 ☐
j. Provides students with structured opportunities to reflect on their own learning.	1 ☐	2 ☐	3 ☐	0 ☐

THE TEACHER:	POORLY	SOMEWHAT WELL	VERY WELL	NOT OBSERVED
k. Provides students with opportunities to practice higher order and critical thinking skills.	1 ☐	2 ☐	3 ☐	0 ☐
l. Provides students with opportunities to develop problem solving skills.	1 ☐	2 ☐	3 ☐	0 ☐

2. AFTER THE LAST OBSERVATION SNAPSHOT, PLEASE RATE EACH OF THE FOLLOWING STATEMENTS ON STUDENTS BEHAVIORS ON THE SCALE FROM 1 TO 3. CHECK ONLY ONE RATING FOR EACH STATEMENT. IF YOU DID NOT OBSERVE THE BEHAVIOR DURING THE OBSERVATION TIME, CHECK "DID NOT OBSERVE."

ASSESSMENT SCALE:

POORLY: THE STUDENTS DEMONSTRATE THE COMPETENCY LESS THAN 50 PERCENT OF THE CLASS PERIOD

SOMEWHAT WELL: THE STUDENTS DEMONSTRATE THE COMPETENCY BETWEEN 50 AND 89 PERCENT OF THE CLASS PERIOD

VERY WELL: THE STUDENTS DEMONSTRATE THE COMPETENCY BETWEEN 90 AND 100 PERCENT OF THE CLASS PERIOD

THE STUDENTS:	POORLY	SOMEWHAT WELL	VERY WELL	NOT OBSERVED
a. Interact with the teacher in open ended discussions and ask questions about content.	1 ☐	2 ☐	3 ☐	0 ☐
b. Apply knowledge of how words are structured to express ideas and concepts orally and in writing.	1 ☐	2 ☐	3 ☐	0 ☐
c. Participate in conversations or discussions where personal opinions are voiced and debated.	1 ☐	2 ☐	3 ☐	0 ☐
d. Are able to link content elements to real-life situations through examples.	1 ☐	2 ☐	3 ☐	0 ☐
e. Participate in group work, project-based learning activities or group presentations.	1 ☐	2 ☐	3 ☐	0 ☐

APPENDIX C

DATA COLLECTION TRAINING AND QUALITY ASSURANCE PROCEDURES

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DATA COLLECTION TRAINING AND QUALITY ASSURANCE PROCEDURES

This Appendix describes the data collection training and quality assurance procedures Mathematica and Espiralica applied at several stages of the data collection process to verify the teacher, director, and classroom observation data and ensure reliability and accuracy. Mathematica and Espiralica conducted a systematic and independent effort to ensure compliance with data collection guidelines and validate the quality of the collected data.

A. Data collector selection and training

Mathematica partnered with the Honduran firm Espiralica to conduct data collection activities in Guatemala. Espiralica was responsible for recruiting field staff based on a series of criteria that we agreed on in meetings. The criteria for the data collectors included: at least 2-3 years of experience in carrying out similar data collection efforts (surveys and/or classroom observations) in the education sector in Guatemala; language fluency including strong foundational writing skills; experience working with previous MINEDUC data collection efforts; and good performance references. Field supervisors and the qualitative data collection training supervisor were held to higher standards. The criteria for hiring these two positions included: at least 5 years of previous experience overseeing data collection efforts and working with qualitative data; demonstrated experience managing field teams; and demonstrated experience reviewing and correcting data entry problems. Espiralica interviewed and selected the best candidates, giving preference to those who had prior experience from the National Statistics Institute in Guatemala.

Espiralica conducted the training workshop for field staff in May 2018 in Guatemala City. They organized the field staff into two groups and so that each group could specialize in a set of instruments. Espiralica trained the first group (enumerators) to administer the teacher and director surveys. The second group (observers) specialized in the Stallings classroom observation instrument. The training workshops consisted of classroom theory as well as hands-on practice at local schools. Both groups consisted of 20 trainees who had to demonstrate their expertise on the instruments at the end of the training week by scoring above 70 percent on final assessments.

Field coordinators and supervisors received additional training to ensure they could oversee the compliance of field staff with the data collection protocols and planned logistics. Espiralica worked closely with the designated supervisors so that they could monitor the team's adherence to the work schedule and verify completed surveys and observations for consistency and accuracy. Espiralica selected the highest-performing enumerators (10) and 10 observers following the end of training assessments. The field staff were then put into two groups, which included both enumerators and observers.

B. Quality assurance procedures

1. Teacher and director survey data quality assurance

Practice and certification at the end of enumerator training. The practice sessions during the enumerator training provided opportunities to build the necessary skill sets before certification. Espiralica assessed the enumerators based on their in-depth knowledge of the survey instruments, project and respondent specifics, their ability to manage the electronic tablets, as well as attitude towards other trainees and respondents during practice sessions. We selected the top ten enumerators based on their performance on the assessments and these additional criteria.

Quality assurance visits during data collection. The enumerators collected the teacher and director survey data using electronic tablets. The field coordinator and supervisors ensured compliance of all enumerators with the survey data collection protocols by spot checking the data in the tablets and observing enumerators in the field. Supervisors conducted enumerator quality assurance visits to schools during the first, second, fourth, and fifth week of the fieldwork. The supervision of enumerators focused on compliance with the survey data collection protocol, such as verifying that enumerators are visiting the correct school and conducting surveys with the correct respondents, administering the consent form in its entirety, reading the survey questions verbatim from their tablets and are not changing the content of the questions or judging respondents' answers.

Quality assurance of data during data collection. Espiralica reviewed all teacher and director survey data as soon as the data were collected from the field to ensure completeness and consistency. When they found mistakes, they notified the field supervisors, who were responsible for re-verifying the data. Supervisors also contacted 50 percent of previously surveyed respondents (teachers and directors) by phone to ask a number of randomly selected survey questions as a way of re-verifying their responses. Espiralica identified inconsistencies in the responses for a few questions (such as respondents' years of experience) during this process so Mathematica requested that Espiralica clarify the survey questions with all enumerators and then contact the other 50 percent of respondents to re-verify their answers for the specific questions that presented a challenge. Two weeks after the start of data collection, Espiralica submitted to Mathematica the initial teacher and director raw survey data for preliminary quality assurance review. The initial teacher survey data contained 27 of the 648 teachers ultimately surveyed. The initial director data contained 18 of the 331 total directors surveyed. Mathematica reviewed these observations to ensure that Espiralica collected accurate and complete data with the administration of its initial teacher and director surveys. The data checks of the preliminary quality assurance review included checking those interviewed were part of the sample, interview completeness, survey logic (e.g., skip patterns were honored), and data accuracy and consistency. Mathematica then worked directly with Espiralica to resolve any issues encountered to improve data collection during the administration of the remaining teacher and director surveys.

Quality assurance of data after completion of fieldwork and before analysis. Espiralica carefully reviewed and cleaned the teacher and director survey data and submitted the cleaned data files to Mathematica. Our internal team conducted an independent review of the completed survey data, which expanded on the data checks conducted during the preliminary review phase. Our internal review included a higher level of detail of the data checks, particularly as it relates

to data accuracy and consistency. For example, we reviewed all discrete and continuous survey variables for outlying values, coded open text responses into existing response categories (if the response was consistent with one of the survey response options), and expanded the data consistency checks to include data more distally related than the data initially reviewed for consistency. We consulted Espiralica to resolve any data issues we encountered during our review. For example, in a few observations of the teacher data, we observed teachers' reported total experience to be less than their experience at their current establishments. For these and similar data inconsistencies, we asked Espiralica to verify the responses, and, if necessary, follow up with the respondents to resolve the inconsistencies.

2. Stallings classroom observation data quality assurance

Practice and certification at the end of observer training. The practice sessions during the observer training took place in 4 schools (outside of the study sample) and provided opportunities for trainees to build the necessary observer skills. The observers spent three days in the practice schools and conducted three full classroom observations each day (for a total of nine during the week). Following the in-school practice sessions, observers debriefed and looked at the inter-rater reliability of the coding for each classroom. In addition to the in-school practice sessions, the training workshop included a number of role-playing and teach-back scenarios intended to reinforce observation skills. The observers took an assessment at the end of the training week and had to achieve an average reliability of 70 percent to be selected to participate in the training. The benchmark score is the "gold standard" established by the World Bank during their work with the Stallings Classroom Observation instrument. Only trainees that met specified certification requirements (that is, cut-off scores of inter-observer agreement) became part of the data collection team. Observers were also assessed on their in-depth knowledge of the observation instrument, project and respondent specifics, their ability to manage the electronic tablets, as well as attitude towards other trainees and respondents during practice sessions.

Quality assurance visits during data collection. Stallings observation data was also collected on tablets. The field coordinator and supervisors were responsible for ensuring compliance of all observers with the observer data collection protocols. Supervisors conducted observer quality assurance visits to schools during the first and second week of the fieldwork. The supervision of observers focused mainly on compliance with the observer protocol, review of the observation notes for each snapshot and the snapshot coding. If supervisors discovered any non-compliance with the observer protocols, they notified the project coordinator, explained the observer's areas of difficulty, and specified the needs for any retraining.

Quality assurance of data during data collection. Espiralica reviewed all observation data from the field to ensure completeness and consistency. They contacted five percent of all schools to verify that the observers visited the school and conducted the observation as planned in the work schedule. Mathematica also requested that Espiralica program a section for notes so that we could verify the consistency of the coding. The observers were trained to record their observation in the classroom for each individual snapshot. Espiralica submitted an initial raw data file with 43 cases (5 percent of all cases) for a preliminary quality assurance review following the first two weeks of data collection. Mathematica reviewed these cases to ensure that Espiralica was collecting accurate and complete data with the initial observations. The data checks included checking schools observed were part of the sample, observation completeness

and logic skip patterns. We also reviewed the snapshot coding for all cases and provided coding recommendations to Espiralica for cases where the snapshot coding was inconsistent with the observation notes and requested that observers include detailed information in the observation notes section.

Quality assurance of data after completion of fieldwork and before analysis. Espiralica carefully reviewed and cleaned the data after the teams completed the field work. They submitted the cleaned data files to Mathematica. Our team conducted an independent data verification process on the classroom observation data. We developed a program to verify the entire instrument logic and verified the data consistency for all classroom observation cases. The program flagged very few issues, such as out of range values, values for variables where we did not expect to see values, and missing values for variables where we expected to see values. We resolved these issues after consulting with Espiralica who provided the correct values based on the original data files and explained that the errors had occurred during the data cleaning phase. In addition to checking the instrument logic, we manually reviewed one snapshot coding for a randomly selected classroom observation sub-sample (5 percent of all cases) and consulted with Espiralica about the coding for a few cases we identified during this review. The coding for most snapshots included in the sub-sample was accurate and we decided not to review any additional snapshots. Lastly, we verified that schools observed were part of the sample and we ensured the variable names, labels and values are consistent with the observation instrument. Where needed, we adjusted variable names and labels to clarify conventions and prepare the file for analysis.

APPENDIX D

EQUIVALENCE ON STUDENT ACADEMIC PERFORMANCE BY SUBGROUPS

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A. Equivalence on student academic performance by subgroups

We examine baseline equivalence in students' academic performance by three subgroups that stakeholders identified as being important before the data were collected: student gender, student ethnicity, and school urban versus rural status[56]. Establishing baseline equivalence for these subgroups is important if we plan to examine the end line impacts of Éxito Escolar as a function of these characteristics.

We find that student academic performance is balanced for female and male students in the T and C groups, but not by students' ethnicity or school's urban status. At baseline, there are no statistically significant differences in the academic performance of female students assigned to the T and C groups (Column A and p-value in Table D.1), nor in the performance of male students in the two groups (Column B and its associated p-value). Further, the difference between the T and C groups by gender is not statistically significant (Column C).

Table D.1. Equivalence on student academic performance, by gender and treatment group

	Treatment effect for female students (A)	p-value	Treatment effect for male students (B)	p-value	Difference in treatment effects by gender (p-value) (C)
Mathematics (percent correct)	1.2	0.18	1.3	0.12	0.77
Language and communication (percent correct)	0.9	0.56	-0.2	0.84	0.19
Natural sciences (percent correct)	1.0	0.43	0.1	0.97	0.16
Total number of students	**3,507**		**4,453**		
Total number of schools	**324**		**327**		

Source: Student Assessments (Pruebas Avanzo) 2018, DIGEDUCA

Notes: Columns A and B present the difference in ordinary least squares regression-adjusted means for female (or male) students in the treatment and control group. Column C shows the p-value for the interaction between treatment status and student gender. Regressions include binary indicators to account for the strata used in the random assignment design. Multilevel linear models were used to account for the clustering of schools in school districts.

We also find no statistically significant differences in the academic performance of ladino students in the T and C groups (Column A and associated p-value in Table D.2), nor in the performance of non-ladino students in the two groups (Column B and associated p-value). However, the difference between the T and C groups in the communication test is significantly larger among ladino students than among non-ladino students (Column C).

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[56] We may include this section in the body of the report, at MCC's request.

Table D.2. Equivalence on student academic performance, by ethnicity and treatment group

	Treatment effect for "ladino" students (A)	p-value	Treatment effect for non-ladino students (B)	p-value	Difference in treatment effect by ethnicity (p-value)
Mathematics (percent correct)	1.6	0.11	1.2	0.14	0.73
Language and communication (percent correct)	1.6	0.31	-0.7	0.59	0.05
Natural sciences (percent correct)	0.5	0.69	0.3	0.77	0.86
Total number of students	**2,887**		**5,014**		
Total number of schools	**217**		**285**		

Source: Student Assessments (Pruebas Avanzo) 2018, DIGEDUCA

Notes: Columns A and B present the difference in ordinary least squares regression-adjusted means for ladino (or non-ladino) students in the treatment and control group. Column C shows the p-value for the interaction between treatment status and student ethnicity. Regressions include binary indicators to account for the strata used in the random assignment design. Multilevel linear models were used to account for the clustering of schools in school districts.

Among students in urban schools, students assigned to T outperform students assigned to C in the three subjects (Column A and p-values in Table D.3). The differences were statistically significant except for communication, which was marginally significant at the 10 percent level. Among students in rural schools, there are no statistically significant differences between the two groups. Not surprisingly, the difference between the T and C groups is significantly larger among students in urban schools than among students in rural schools (Column C).[57] We will consider the lack of equivalence by urban status and ethnicity when interpreting our end line results.

Table D.3. Equivalence on student academic performance, by school urban status and treatment group

	Treatment effect for students in urban areas (A)	p-value	Treatment effect for students in rural areas (B)	p-value	Difference in treatment effect by urban status (p-value)
Mathematics (percent correct)	3.5***	0.00	0.4	0.63	0.00
Language and communication (percent correct)	2.6*	0.08	-0.8	0.52	0.00
Natural sciences (percent correct)	3.2**	0.02	-0.6	0.61	0.00
Total number of students	**3,543**		**4,370**		
Total number of schools	**62**		**269**		

Source: Student Assessments (Pruebas Avanzo) 2018, DIGEDUCA

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[57] We found discrepancies in the baseline data provided by school directors and by DIGEMOCA regarding schools' urban status. Our analyses used data from DIGEMOCA, except when the data were missing, in which case we used school reports. We will verify this information at end line and will re-run our baseline equivalence model if needed.

Notes: Columns A and B present the difference in ordinary least squares regression-adjusted means for urban (or rural) students in the treatment and control group. Column C shows the p-value for the interaction between treatment status and school urban status. Regressions include binary indicators to account for the strata used in the random assignment design. Multilevel linear models were used to account for the clustering of schools in school districts.

*Difference in group means is marginally significant at the .10 level.

**Difference in group means is statistically significant at the .05 level.

***Difference in group means is statistically significant at the .01 level.

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APPENDIX E

ADDITIONAL ANALYSES FROM THE STALLINGS CLASSROOM OBSERVATIONS

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A. Additional results from the Stallings classroom observations

There are many dimensions to the Stallings classroom observation results. In the body of the report, our results focus on higher level findings such as on-task verses off-task; materials used by the teacher; and teacher and student engagement. We focus on these three areas because they are the most important for establishing equivalence among the treatment and control schools. However, it is also important to understand the type of pedagogy teachers' use in the classroom (e.g., active verses passive), the activities they engage in most frequently, and the details of what students do when they are not engaged with the teacher. The findings in these areas help us better understand nuanced differences with in the classrooms and contributes to the implementation study over time. In this section we summarize the additional analyses we conducted with the baseline classroom observation data.

1.   Teacher's pedagogical practices

Tables 5.1 through 5.3 describe the percentage of time teachers devote to core pedagogical practices by subject and treatment group. In terms of equivalence, there are no statistically significant differences in the teacher's use of core pedagogical practices between the treatment and control classrooms by any of the subjects (i.e. mathematics, communication, natural sciences). However, it is interesting to look at some of the ways teachers in different subjects spend their time.

In mathematics (Table E.1), teachers spend a predominance of their time in demonstration and lecture compared to the other types of practices (32 percent and 35 percent, respectively in the treatment and control groups). They spend the next highest percentage of time in discussion/question and answer (16 percent and 13 percent, respectively), though students in the control group do spend more time copying than asking questions. This type of pedagogy makes sense and is what we expect in many mathematics classrooms. Teachers often use the blackboard or textbooks to teach students mathematical concepts, so while lecturing is a more passive method of instruction, in mathematics, it is important since students have to learn the concepts before they can discuss them. We also expect students to raise questions or clarify these concepts. Over the next three years, we anticipate that the GEP PADEP/CB will help teachers not only increase the amount of overall time spent in academic instruction, but that we see increases in discussion/QA showing that teachers are learning to teach and engage their students in the process more actively.

Table E.1. Teacher's use of time at baseline (percentage of time) in mathematics, by treatment group

	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Teachers' core pedagogical practices (percentage)				
Reading aloud	2.4	2.9	-0.5	0.31
Demonstration/Lecture	31.5	34.6	-3.1	0.06
Discussion/Q&A	16.5	13.1	3.4	0.02
Practice and Memorization	0.2	0.7	-0.5	0.01
Assignment/Class Work	7.9	8.2	-0.3	0.80
Copying	13.2	15.2	-2	0.23
Breakdown of teacher class management tasks (percentage)				
Discipline	0.9	0.5	0.4	0.19

	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Classroom management	8.5	7.9	0.5	0.57
Classroom management alone	6.3	5.9	0.5	0.60
Breakdown of teacher time off-task (percentage)				
Social interaction with students	1.8	1.8	-0.1	0.87
Social interaction/Uninvolved	2.5	2.4	0.1	0.92
Absent from the room	9	7	1.9	0.34
Total number of classrooms	**150**	**164**		
Total number of schools	**150**	**163**		

Source: Stallings Classroom Observations 2018.

Note: Columns A and B present ordinary least squares regression-adjusted group means and include covariates to account for the design (strata variables). Multilevel mixed-effects linear models were used to account for the clustering of teachers in school districts. Regressions include sampling weights. To account for multiple comparisons with inter-related outcomes we apply a Bonferroni correction.

In language and communication classes, we see a similar pattern to pedagogical practices as in the mathematics classrooms. Teachers in both the treatment and control schools spend approximately 30 percent of their time lecturing and only 16-17 percent of the time engaging students in discussion, debate or Q&A. Teachers also spend more time having students copy material, than in mathematics and natural science. Communication classes present more opportunities for teachers to create active classrooms where students can engage in debates and discussions around different thematic topics, even when teaching grammar and writing. The baseline shows us that there is very little active instruction taking place in the communication classrooms.

Table E.2. Teachers' use of time at baseline (percentage of time) in communication, by treatment group

	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Teachers' core pedagogical practices (percentage)				
Reading aloud	7.6	6.8	0.8	0.43
Demonstration/Lecture	29.8	29.6	0.2	0.91
Discussion/Q&A	16.4	17	-0.7	0.75
Practice and Memorization	0.6	0.1	0.5	0.08
Assignment/Class Work	8.7	6.8	1.9	0.23
Copying	11.4	13.2	-1.8	0.33
Breakdown of teacher class management tasks (percentage)				
Discipline	0.9	0.9	0.0	0.87
Classroom management	10.5	9.3	1.2	0.23
Classroom management alone	4.8	6.5	-1.7	0.06
Breakdown of teacher time off-task (percentage)				
Social interaction with students	1.8	1.6	0.3	0.49
Social interaction/Uninvolved	2.3	2.6	-0.3	0.45
Absent from the room	5.3	5.7	-0.4	0.64
Total number of classrooms	**158**	**171**		
Total number of schools	**153**	**167**		

Source: Stallings Classroom Observations 2018.

Note: Columns A and B present ordinary least squares regression-adjusted group means and include covariates to account for the design (strata variables). Multilevel mixed-effects linear models were used to account for

the clustering of teachers in school districts. Regressions include sampling weights. To account for multiple comparisons with inter-related outcomes we apply a Bonferroni correction.

Teachers in natural sciences also spend most of their time lecturing to students and having them copy material. While some passive teaching is always present in classrooms, the lack of discussion and debate (only 13-14 percent of time) suggests that either teachers do not know how to engage students, or perhaps they are lacking materials (such as books, notebooks, lab equipment) that can often facilitate a more dynamic classrooms. These are issues that we will probe during the qualitative implementation study.

Table E.3. Teachers' use of time at baseline (percentage of time) in natural science, by treatment group

	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Teachers' core pedagogical practices (percentage)				
Reading aloud	5.4	5.2	0.1	0.89
Demonstration/Lecture	33.6	32.9	0.8	0.71
Discussion/Q&A	13	14.5	-1.4	0.39
Practice and Memorization	0.1	0.1	0.0	0.85
Assignment/Class Work	5.1	5.3	-0.3	0.83
Copying	15.0	13.8	1.2	0.62
Breakdown of teacher class management tasks (percentage)				
Discipline	0.9	0.9	0.1	0.87
Classroom management	10.8	7.8	3.0	0.04
Classroom management alone	5.1	5.4	-0.3	0.65
Breakdown of teacher time off-task (percentage)				
Social interaction with students	1.9	2.5	-0.6	0.23
Social interaction/Uninvolved	1.7	2.9	-1.2	0.14
Absent from the room	7.8	8.1	-0.4	0.77
Total number of classrooms	135	146		
Total number of schools	134	145		

Source: Stallings Classroom Observations 2018.

Note: Columns A and B present ordinary least squares regression-adjusted group means and include covariates to account for the design (strata variables). Multilevel mixed-effects linear models were used to account for the clustering of teachers in school districts. Regressions include sampling weights. To account for multiple comparisons with inter-related outcomes we apply a Bonferroni correction.

Once we analyzed the percentage of time teachers spent in the various pedagogic activities, we converted the percentages into minutes to help us quantify the learning time that takes place during the day. These results are presented in Table E.4. The distribution of percentage of time spent on core pedagogical practices is similar to the distribution of average minutes; however, we observed some differences between treatment and control groups – one of which is statistically significant at 10 percent. We believe the statistical significance appears in the minutes analyses due to the greater variation in the minutes scale.

One of the striking aspects of looking at academic time on task is our ability to quantify actual learning time. Across all three subjects, teachers currently spend between 10 and 12 minutes actually **teaching** or lecturing to students on content. While discussion and debate takes of around 15 percent of the class time, it equates to less than **six minutes** of interaction between

students and teachers. As we begin to look at student learning outcomes in the Ciclo Básico and the number of students who are behind grade level – the amount of learning time that actually takes place in the classroom begins to explain why so many students in the five Departments are lagging behind.

Table E.4. Teachers use of time at baseline (average minutes), by subject and treatment group

Subject	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Mathematics				
Teachers' core pedagogical practices (avg minutes)				
Reading aloud	0.9	1.2	-0.2	0.26
Demonstration/Lecture	11.2	12.7	-1.4	0.02
Discussion/Q&A	5.8	4.8	1.0	0.07
Practice and Memorization	0.1	0.3	-0.2*	0.01
Assignment/Class Work	2.8	3.1	-0.3	0.40
Copying	4.6	5.4	-0.7	0.21
Breakdown of teacher class management tasks (avg minutes)				
Discipline	0.3	0.2	0.1	0.28
Classroom management	3.0	2.9	0.1	0.72
Classroom management alone	2.3	2.3	0.0	1.00
Breakdown of teacher time off-task (avg minutes)				
Social interaction with students	0.7	0.7	-0.0	0.94
Social interaction/Uninvolved	0.9	1	-0.1	0.60
Absent from the room	3.5	2.7	0.9	0.27
Total number of classrooms	**150**	**164**		
Total number of schools	**150**	**163**		
Language and Communication				
Teachers' core pedagogical practices (avg minutes)				
Reading aloud	2.9	2.7	0.2	0.64
Demonstration/Lecture	10.5	10.8	-0.3	0.60
Discussion/Q&A	5.8	6.3	-0.5	0.46
Practice and Memorization	0.2	0.0	0.2	0.08
Assignment/Class Work	3.2	2.5	0.7	0.32
Copying	3.7	4.7	-0.9	0.15
Breakdown of teacher class management tasks (avg minutes)				
Discipline	0.3	0.3	-0.0	0.91
Classroom management	3.8	3.5	0.4	0.37
Classroom management alone	1.8	2.4	-0.7	0.02
Breakdown of teacher time off-task (avg minutes)				
Social interaction with students	0.6	0.6	0.0	0.68
Social interaction/Uninvolved	0.8	1.0	-0.2	0.19
Absent from the room	2	2.2	-0.3	0.51
Total number of classrooms	**158**	**171**		
Total number of schools	**153**	**167**		
Natural sciences				
Teachers' core pedagogical practices (avg minutes)				
Reading aloud	1.9	2	-0.1	0.74
Demonstration/Lecture	11.7	12	-0.3	0.69
Discussion/Q&A	4.6	5.4	-0.8	0.18
Practice and Memorization	0.1	0.0	0.0	0.70
Assignment/Class Work	2	2.1	-0.1	0.80

Subject	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Copying	5	5	-0.0	0.98
Breakdown of teacher class management tasks (avg minutes)				
Discipline	0.3	0.3	0.0	0.96
Classroom management	3.7	3.0	0.7	0.11
Classroom management alone	1.8	2.0	-0.2	0.49
Breakdown of teacher time off-task (avg minutes)				
Social interaction with students	0.7	0.9	-0.2	0.22
Social interaction/Uninvolved	0.6	1.1	-0.5	0.11
Absent from the room	3.0	3.1	-0.0	0.96
Total number of classrooms	**135**	**146**		
Total number of schools	**134**	**145**		

Source: Stallings Classroom Observations 2018.

Note: Columns A and B present ordinary least squares regression-adjusted group means and include covariates to account for the design (strata variables). Multilevel mixed-effects linear models were used to account for the clustering of teachers in school districts. Regressions include sampling weights. To account for multiple comparisons with inter-related outcomes we apply a Bonferroni correction.

*Difference in group means is statistically significant at the .10 level.

2. Academic instruction, classroom management, and off task activities

Table E.5 groups the various Stallings pedagogical practices into three main groups: academic instruction, classroom management and off task and shows the amount of time (in minutes) that teachers spend on each grouping during a 35 minute class period. We find a statistically significant difference (5 percent level) between the treatment and control groups related to the teachers' use of academic instruction during mathematics class. However, when we look at the difference more closely, it is only a 2 minute difference in the total time spent on instruction. While the data demonstrates this small group imbalance, we do not believe it is a significant finding in terms of learning or what we know about instruction in classrooms. We believe that the treatment and control classrooms are largely equivalent in teacher use of instructional time.

Table E.5. Teachers use of time at baseline (in minutes), by subject and treatment group

Subject	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Mathematics				
Teachers' use of instructional time (avg minutes)				
Instruction	25.4	27.4	-2.0**	0.01
Classroom management	5.6	5.4	0.2	0.66
Off task	4.9	4.3	0.6	0.40
Total number of classrooms	**150**	**164**		
Total number of schools	**150**	**163**		
Language and Communication				
Teachers' use of instructional time (avg minutes)				
Instruction	26.3	27.1	-0.8	0.29
Classroom management	5.9	6.2	-0.3	0.55
Off task	3.4	3.8	-0.4	0.32
Total number of classrooms	**158**	**171**		
Total number of schools	**153**	**167**		

Subject	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Natural sciences				
Teachers' use of instructional time (avg minutes)				
Instruction	25.1	26.6	-1.5	0.11
Classroom management	5.9	5.4	0.5	0.35
Off task	4.3	5.1	-0.8	0.31
Total number of classrooms	**135**	**146**		
Total number of schools	**134**	**145**		

Source: Stallings Classroom Observations 2018.

Note: Columns A and B present ordinary least squares regression-adjusted group means and include covariates to account for the design (strata variables). Multilevel mixed-effects linear models were used to account for the clustering of teachers in school districts. Regressions include sampling weights.

**Difference in group means is statistically significant at the .05 level.

3.   Teacher's use of materials in the classroom

Table E.6 describes the amount of time (in minutes) that teachers spend using different types of materials in the classroom.

We also calculated the percentage of time that treatment and control teachers spent using materials, or not using any materials. These results are presented in table VI.15 in the main report.

Table E.6. Teachers' use of materials at baseline (time in minutes), by subject and treatment group

Subject	Treatment Mean (A)	SD	Control Mean (B)	SD
Mathematics				
Use of materials breakdown (avg minutes)				
No materials	2.6	1.1	2.3	1.1
Book	3.0	1.5	4.3	1.5
Notebook	5.7	2	5.9	2
Blackboard	12.0	2.4	12.4	2.4
Didactic material	1.6	1.5	2.2	1.5
Information, communication, and technology (ICT)	0.5	0.5	0.4	0.5
Total number of classrooms	150		164	
Total number of schools	150		163	
Language and Communication				
Use of materials breakdown (avg minutes)				
No materials	4.5	1.5	5.0	1.5
Book	7	2.4	8.6	2.4
Notebook	4.9	2.2	5.1	2.2
Blackboard	6.5	2.0	5.2	2.0
Didactic material	2.9	1.3	2.5	1.3
Information, communication, and technology (ICT)	0.5	0.6	0.6	0.6
Total number of classrooms	158		171	
Total number of schools	153		167	

Subject	Treatment Mean (A)	SD	Control Mean (B)	SD
Natural sciences				
Use of materials breakdown (avg minutes)				
No materials	5.4	1.4	5.5	1.4
Book	6.7	2.6	8.7	2.6
Notebook	4.4	2.3	5	2.3
Blackboard	3.8	1.3	3.5	1.3
Didactic material	3.9	2.7	2.8	2.7
Information, communication, and technology (ICT)	0.5	0.8	0.9	0.8
Total number of classrooms	**135**		**146**	
Total number of schools	**134**		**145**	

Source: Stallings Classroom Observations 2018.

Note: Columns A and B present ordinary least squares regression-adjusted group means and include covariates to account for the design (strata variables).

4. Activities of students who are not engaged with the teacher

Table E.7 describes the activities of students who were not engaged with a teacher-led activity. The groups are equivalent across the activities and we find that regardless of the subject, when students were not engaged with the teacher they were either engaged in social interaction with other students (27-38 percent of the time), or they were unengaged (22-27 percent of the time). What this means is that when the teacher is engaged in academic instruction, 60-70 percent of the time there is at least one or more students doing non-academic activities such as talking, sleeping, or not paying attention.

Table E.7. Activities of students not engaged with teacher-led activity at baseline (percentage of snapshots), by subject and treatment group

Subject	Treatment Mean (A)	SD	Control Mean (B)	SD
Mathematics				
Reading out lout	0.0	0.1	0.0	0.1
Lecturing or Class instruction/Demonstration	1	0.7	0.2	0.7
Discussion/Debate/Questions and Answers	4	4.1	2.4	4.1
Individual class assignment / Class work	15.8	3.9	14.4	3.9
Copying	4.7	2.3	3.9	2.3
Social interaction (among students)	38.1	6.9	27.5	6.9
Classroom management	0.7	0.8	0.9	0.8
Student not involved	26.3	10.3	22.9	10.3
Total number of classrooms	150		164	
Total number of schools	150		163	
Language and Communication				
Reading out lout	0.1	0.4	0.2	0.4
Lecturing or Class instruction/Demonstration	0.7	0.5	0.5	0.5
Discussion/Debate/Questions and Answers	1.8	2.0	1.6	2.0
Individual class assignment / Class work	11.6	5.2	11.9	5.2
Copying	3.3	2.4	3.1	2.4
Social interaction (among students)	33.4	5.4	30.3	5.4
Classroom management	1.3	1.1	1.4	1.1
Student not involved	25.1	7.8	24.4	7.8
Total number of classrooms	158		171	
Total number of schools	153		167	

Subject	Treatment Mean (A)	SD	Control Mean (B)	SD
Natural sciences				
Reading out lout	-0.0	0.2	0.1	0.2
Lecturing or Class instruction/Demonstration	0.5	0.8	0.7	0.8
Discussion/Debate/Questions and Answers	1.1	2.2	1.6	2.2
Individual class assignment / Class work	9	5.1	11.5	5.1
Copying	3.2	2.8	2.2	2.8
Social interaction (among students)	35.1	7.2	31.6	7.2
Classroom management	0.4	0.8	1.1	0.8
Student not involved	26.4	10.4	26.7	10.4
Total number of classrooms	**135**		**146**	
Total number of schools	**134**		**145**	

Source: Stallings Classroom Observations 2018.

Note: Columns A and B present ordinary least squares regression-adjusted group means and include covariates to account for the design (strata variables).

5.   Teacher and student engagement in academic and non-academic activities

Finally, Table E. 8 describes the average time in minutes that a large group of students (6 or more students) or the entire class were engaged in one of the three main activities **with the teacher** (academic instruction, classroom management and off task). We find a statistically significant difference at the 1 percent level in the student engagement with the teacher in academic activity during mathematics class. The results show that large groups of students are more likely to be engaged with the teacher in academic instruction in control schools than in treatment schools. However, the difference is small at face value level - approximately 2.5 minutes less in the treatment than in the control group. We do not find any other statistically significant differences in the student engagement between the treatment and control classrooms by subject, suggesting that the two groups are largely equivalent in student engagement. We also note that most or all of the students in both groups tend to be engaged in academic instruction for 20-25 minutes of the 35 minute class period. While the instruction time is not long, it does account for approximately 65 percent of the class period.

Table E.8. Student engagement at baseline (average time in minutes), by subject and treatment group

Subject	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
Mathematics				
All students or a large group engaged in academic activity (avg min)	22.2	24.7	-2.5***	0.01
All students or a large group engaged in management activity (avg min)	3.8	3.9	-0.1	0.77
All students or a large group off task (avg min)	2.4	2.3	0.2	0.83
Total number of classrooms	149	164		
Total number of schools	149	163		
Language and Communication				
All students or a large group engaged in academic activity (avg min)	24.1	24.7	-0.6	0.39
All students or a large group engaged in management activity (avg min)	4.7	4.5	0.2	0.71

Subject	Treatment Mean (A)	Control Mean (B)	Difference (A-B)*/**	P-value
All students or a large group off task (avg min)	2.1	2.9	-0.8	0.20
Total number of classrooms	158	171		
Total number of schools	153	167		
Natural sciences				
All students or a large group engaged in academic activity (avg min)	23.1	24.3	-1.2	0.21
All students or a large group engaged in management activity (avg min)	4.9	4.7	0.3	0.52
All students or a large group off task (avg min)	3.6	3.6	0.0	0.97
Total number of classrooms	**134**	**146**		
Total number of schools	**133**	**145**		

Source: Stallings Classroom Observations 2018.

Note: Columns A and B present ordinary least squares regression-adjusted group means and include covariates to account for the design (strata variables). Multilevel mixed-effects linear models were used to account for the clustering of teachers in school districts. Regressions include sampling weights.

In Panel A, a minimum of 22 classrooms and schools were observed in the treatment group and 27 in the control group. Due to the calculation of the percentage of snapshots, a large group of students or the entire class were engaged in a specific activity with the teacher, using only the snapshots when the teacher was conducting this activity.   In Panel B, a minimum of 24 classrooms and schools were observed in the treatment group and 23 in the control group. In Panel C, a minimum of 24 classrooms and schools were observed in the treatment group and 30 in the control group.

***Difference in group means is statistically significant at the .01 level.

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APPENDIX F

DESCRIPTIVE ANALYSIS BY SCHOOL MODALITY

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A. Descriptive analysis by school modality

Our baseline equivalence analyses revealed that the proportion of INEB and Telesecundaria schools is statistically different *across the treatment and control groups*, at a significant level. In this section we examine how students and schools may differ by school modality, to explore how the distribution of INEB and Telesecundaria schools across the treatment groups might influence the endline findings. We present descriptive statistics on students' performance and a select number of student and school characteristics that are expected to be associated with student performance, based on existing literature. The reader should bear in mind that while descriptive analyses can be useful for generating hypotheses, they do not permit establishing whether the differences observed are statistically significant.

It is also important to remember that the *study sample* is also not well balanced in terms of school modality. This means that we do not have similar numbers of schools for each modality in the sample as a whole. Specifically, our sample includes 162 telesecundaria, 63 cooperativa, 51 INEB, 51 NUFED, and only 4 PEMEM schools. This imbalance is mainly due to the distribution of schools of different modalities in the sampling frame, which limits the number of schools per modality that could be possibly sampled (unfortunately, school modality information was not available for all schools in the sampling frame at the time of sampling). To a lesser extent, the imbalance is also due to our sampling approach, which was designed to ensure the inclusion of as many districts as possible (districts are the unit of randomization) as well as 25 percent of schools in the treatment group and all schools in the control group, but not to ensure a balanced representation of schools of different modalities. Because the study sample is not meant to be representative of schools of a specific modality, we should be cautious not to extrapolate these findings to all INEB or Telesecundaria schools, for example.

Overall, the descriptive findings do not reveal sizable differences between school modalities, except for an advantage of PEMEM schools over schools in the other modalities. Students in the 4 PEMEM schools in the sample obtained higher test scores than students in other modalities, and also appear to have fewer risk factors for low academic performance, such as not speaking Spanish or working for pay. Even though differences among schools in modalities other than PEMEM are not consistent and appear small, Telesecundaria and NUFED students had lower test scores than students in the other modalities; a higher proportion of Telesecundaria students than students in all other modalities reported not speaking Spanish, working for pay, and having dropped out; and a higher proportion of INEB schools reported unfavorable classroom conditions such as lack of desks, insufficient lighting, and being located in a rural area. The findings suggest, but do not prove, that differences in the proportion of INEB and Telesecundaria schools between the treatment and control groups may not systematically influence our endline findings. However, we will adjust for this imbalance in our endline statistical models. We describe the findings from the descriptive exploratory analysis in more detail below.

On average, PEMEM students were the only students to answer more than half of the questions in the communication and natural sciences assessments correctly. They were also the only students to correctly respond to more than 40 percent of the questions correctly in the mathematics assessment. Across modalities other than PEMEM, the percentage of students who

answered the questions correctly was similar, although Telesecundaria and NUFED students consistently obtained the lowest test scores across all modalities (Figure F.1).

Figure F.1. Student academic performance by school modality
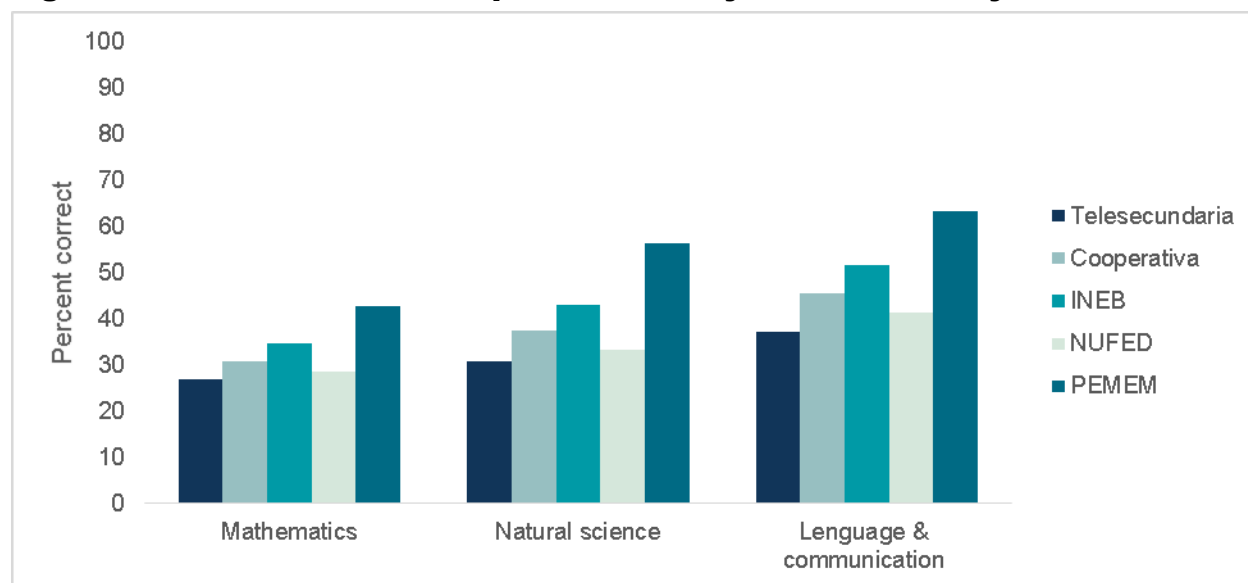
Source: Student Assessments (Pruebas Avanzo) 2018, DIGEDUCA

PEMEM students also reported fewer risks for low performance than students in the other four modalities. Only 7 percent reported not speaking Spanish, while at least 26 percent of students in the other modalities did. Similarly, less than 5 percent of PEMEM students reported working for pay, compared to 24 to 36 percent for students in other modalities. PEMEM students also stood out for their low levels of drop out and for having the lowest level of repetition across all modalities: only 3 percent had dropped out compared to 14 to 19 percent of in other modalities, and 17 percent had repeated a grade compared to 36 to 39 percent in other modalities. Finally, half of PEMEM students reported their mothers did not complete high school, compared to at least 79 percent in the other modalities (Figure F.2).

Among all modalities, Telesecundaria schools have the highest proportion of students who do not speak Spanish and slightly higher proportions of students who work for pay or have dropped out. Compared to students in Cooperativa and INEB schools, but not to NUFED schools, Telesecundaria schools have a higher proportion of students whose mother did not complete high school (Figure F.2).
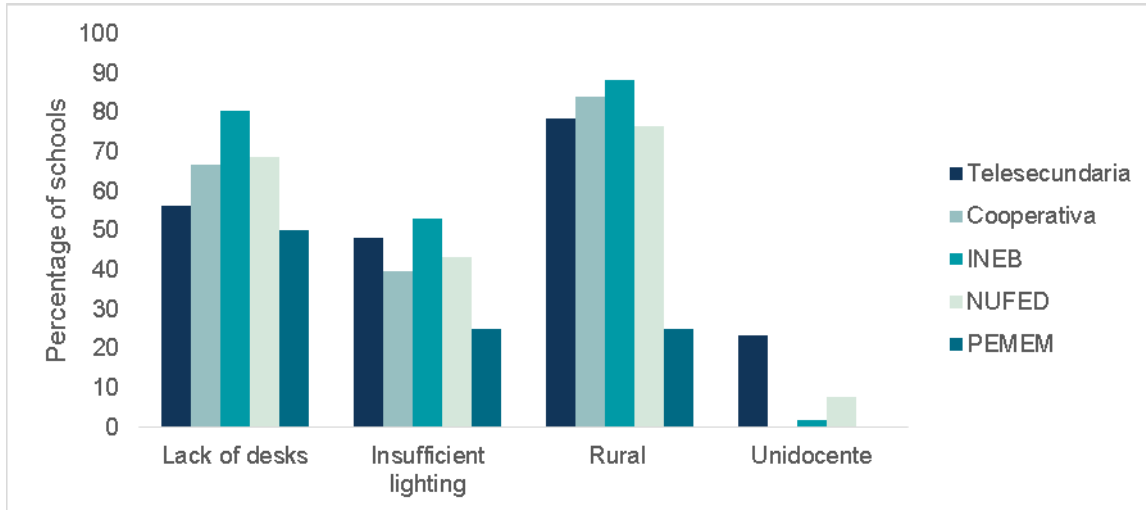
Figure F.2. Student risk factors by school modality
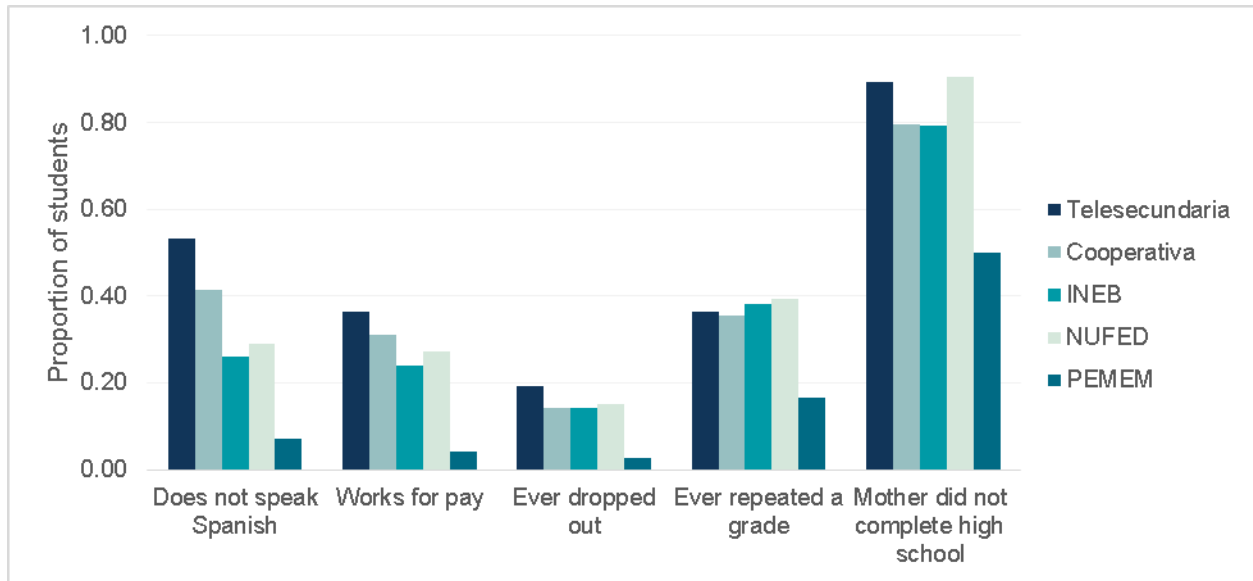
School conditions also appear to favor the 4 PEMEM schools in the sample. Fewer school directors in PEMEM schools reported having insufficient desks or lightning in the classrooms. Also, only 25 percent of PEMEM schools were located in rural areas, compared to 76 to 88 percent of schools in other modalities. Finally, there were no PEMEM schools where a single teacher is in charge of all subjects, which likely means that teachers are more likely to specialize in the subject they teach.

Schools in the other modalities reported similar conditions, even though a higher percentage of INEB schools reported lack of desks and slightly more reported insufficient lighting and being located in rural areas. A higher percentage of Telesecundaria schools reported having a single teacher (see Figure F.3).

Figure F.3. School and classroom conditions by school modality

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