Document of the Inter-American Development Bank

**Belize**

**Education Quality Improvement Program**

**(BL-L1018)**

**monitoring and evaluation plan**

This document was prepared by: Miguel Paredes (consultant) in collaboration with Emma Näslund-Hadley (SCL/EDU).

**Contents**

1. Introduction
2. Monitoring
   1. Indicators
   2. Data Collection, Instruments and Reporting
   3. Capacity Building for Monitoring Activities
   4. Additional monitoring tools
   5. Audits
   6. Monitoring and Evaluation Risks
   7. Monitoring Coordination, Work Plan and Budget
3. Evaluation
   1. Objective and Main Evaluation Questions
   2. Main outcome and impact indicators
   3. General Evaluations
      1. Existing Knowledge
      2. Evaluation Methodology
      3. Evaluation Frameworks
   4. Impact Evaluation of Interactive Radio Instruction (IRI)
      1. Existing Knowledge
      2. Evaluation Methodology
      3. Technical Aspects of Selected Methodology
   5. Reporting Evaluation Results
   6. Coordinación, plan de trabajo y presupuesto de la evaluación

Abbreviations

|  |  |
| --- | --- |
|  |  |
| AOP | Annual Operation Plan |
| ATE | Average Treatment Effect |
| EQIP | Education Quality Improvement Program |
| GOB | Government of Belize |
| EMIS | Education Management Information System |
| EQIP | Educational Quality Improvement Program |
| MDE | Minimum Detectable Effect Size |
| MOEYS | Ministry of Education Youth and Sports |
| PEU | Program Executing Unit |
| POM | Program Operation Manual |
| PSTT | Pre-service Teacher Training |
| PT | Principal Training |
| RCT | Randomized Control Trial |
| TCPD | Teacher Continuous Professional Development |
| TEI | Teacher Education Institute |
|  |  |

|  |  |
| --- | --- |
|  |  |
|  |  |

# Introduction

* 1. This document describes the monitoring and evaluation arrangements for the Education Quality Improvement Program (EQIP) (BL-L1018). It lists the instruments for project performance monitoring and specifies the monitoring and evaluation responsibilities of the Project Executing Unit (PEU). It further describes the evaluation plan for the first two components of the project.
  2. The overall objective of the operation is to improve the quality of primary education, and the governance of the Belize education system. The specific objectives are to: (i) train approximately 50 percent of Teacher Education Institute (TEI) pre-service instructors teaching methods courses and 46 percent of in-service teachers at the primary level; (ii) train approximately 37 percent of primary school principals in instructional leadership and administration; (iii) develop and implement an Education Management Information System (EMIS) for 100% of schools at the primary and secondary levels; and (iv) improved profile of teacher candidates. This will be achieved through investments in three components.
  3. **Component I: Improving the Quality of Teachers.**The component aims to improve the quality of primary school teachers by raising the profile of teacher candidates, improving the quality of initial teacher education, and improving the skills of in-service teachers. To achieve this objective, the component will finance: (i) a marketing campaign to attract higher profile candidates for teacher training, including a higher proportion of male applicants; (ii) assessment of teacher training candidates to identify those who need remedial assistance during their teacher training; (iii) capacity building of staff at TEIs to improve the Pre-Service Teacher Training (PSTT) in pedagogical practices and content knowledge in Math, Science, and Language Arts, focusing on how to link the teaching of content with concrete content specific pedagogy; and (iv) on-site and distance Teacher Continuous Professional Development (TCPD) for principals and teachers currently in the classrooms on student-centered pedagogy in Language Arts, Math, and Science.
  4. **Component II: Governance of the Education System**. The component aims to create a quality assurance system to improve education policy planning and accountability mechanisms at various levels of the education system, including schools, the TEIs, and the Ministry of Education Youth and Sports (MOEYS). To achieve this objective, the component will finance: (i) a feedback system to strengthen the capacity of TEIs to monitor the quality of their services and outputs; (ii) training, mentoring, and technical assistance to principals, department heads, and administrators of the TEIs on how to monitor and assure the quality of their services; (iii) the development of an entry into profession exam for new teacher candidates; (iv) training and technical assistance to principals to promote their leadership as the vehicle for improving school and student performance, including training on data collection and reporting processes, as well as the use of student data to identify teacher professional development needs and develop school improvement plans; (v) creation of an integrated EMIS with information on student enrollment and results, student and teacher attendance, school infrastructure, use of curricula and textbooks, teacher qualifications, etc., to enable planning and quality assurance at various levels of the system (schools, district education offices, and central level); (vi) training and technical assistance to the MOEYS and schools in the use of the EMIS for the purposes of quality assurance; and (vii) training and technical assistance to increase parent participation in school management.
  5. **Component III: Evaluation.** The component will finance the evaluation of the operation through two sub-components. The component will finance: (i) the Evaluation of the Pre-service Teacher Training and a Randomized Control Trial (RCT) of the On-site Practical Professional Development and Principal Training.

# Monitoring

#### Indicators

* 1. Table 1 includes product indicators that will be monitored during the operation. To consider the complete set of indicators, refer to the results matrix.

|  |  |  |
| --- | --- | --- |
| **Table 1.Summary of monitoring indicators, frequency and sources.** | | |
| **Monitoring Indicators** | **Frequency of Measurement** | **Source of Verification** |
| **Component I** | | |
| Marketing campaign strategy to attract teacher candidates developed and implemented. | Semi-annually in relation to administration mission | Project administrative data; Semi-annual project reports; Mid-term and final review. |
| # of methods teacher trainers and other TEI staff trained. | Semi-annually in relation to administration mission | Project administrative data; Semi-annual project reports; Mid-term and final review. |
| # of teachers trained | Semi-annually in relation to administration mission | Project administrative data; Semi-annual project reports; Mid-term and final review. |
| **Component II** | | |
| # of primary School Principals, General and Local Managers, and Education Officers trained in school administration and educational leadership. | Semi-annually in relation to administration mission | Project administrative data; Semi-annual project reports; Mid-term and final review. |
| # of parents trained to increase their participation in school management. | Semi-annually in relation to administration mission | Project administrative data; Semi-annual project reports; Mid-term and final review. |
| Integrated Education Management Information System (EMIS) in operation. | Semi-annually in relation to administration mission | Project administrative data; Semi-annual project reports; Mid-term and final review. |

#### Data Collection, Instruments and Reporting

* 1. To evaluate the EQIP, each of the interventions must be evaluated and, therefore, must undergo a data collection process where surveying instruments are used to register and monitor key outcome variables that will finally be reported.
  2. This data collecting process and the instruments that will be employed depend on the type of evaluation strategy to be used on each of the three interventions: the PSTT for future teachers who are undergoing training in the TEIs, the TCPD for in-service teachers, and the Principal Training (PT) for principals, department heads, and administrators.
  3. The TCPD will be evaluated through a RCT, which will require that both treatment and control schools be surveyed. The grades that will be a part of the evaluation study are infant II, and standards 2 and 5. The evaluation will require baseline, intermediate and endline surveys for the teachers and for the students (to assess knowledge, attitudes, and perceptions of teachers and academic school outcomes in Math, Science, and English). These instruments will be developed specifically for the teacher training intervention or adapted from former studies, depending on the primary school grades to be intervened.
  4. For the pre-service teacher component (quasi-experimental) we will require baseline, some follow-up, and endline instruments, although they will most likely all be very similar as the intention is to capture the changes in the instructors’ knowledge, attitudes, and perceptions about and towards training future-to-be teachers.

#### Capacity Building for Monitoring

* 1. The Government of Belize (GOB) will receive two monitoring and evaluation workshops that will cover fundamentals of monitoring processes and impact evaluations as they relate to the programs under the loan. These trainings will be performed by the external evaluation and surveying consultants that will be contracted with resources from the program.

#### Audits

* 1. **Audits.** For each fiscal year during project execution, the MOEYS through the PEU will be responsible of producing annual audited financial statements and one final audited financial statement at the end of the program. The Financial Statements will be audited by a firm of independent public accountants acceptable to the IDB. The firm will be selected according to IDB’s procurement procedures for audit firms (Document AF-200). The audits should include all co‑financing resources and the review of procurement and disbursement processes of the PEU. Furthermnore, at project initiation the IDB Country Office will provide the standard accounting and auditing documents to the PEU and the selected Auditors. The PEU must (i) process requests for disbursement and respective justifications of expenses, in accordance with IDB procedures for disbursements; and (ii) submit to the IDB within 120 days, following the closing of each fiscal year of the GOB, and at the closing of the project, audited financial statements.
  2. The PEU shall maintain: i) a financial information system acceptable to the Bank that enables accounting, budgetary and financial record keeping, as well as the issuance of financial statements and other reports related to the resources of the Financing and other financial resources, as the case may be; and ii) an internal control structure that enables effective Project management; provides reliability regarding the financial information and the physical, magnetic and electronic records and files; and enables the fulfillment of the provisions of the Loan Contract. Auditing records must reflect each and all sources of financing related to the Program, including the counterpart. Detailed accounts are to be kept by the PEU, which is responsible for the timely accounting of the inflows and outflows and the preparation of corresponding financial statements. A filing system must be established that permits indexing of support documents by Component, Sub- component and Activity, by assigning a unique identifier number to activities and which facilitates auditing by project and by contract. The PEU shall preserve the original records of the Project for a minimum period of three (3) years after the date agreed upon for the final disbursement of the Financing,

#### Monitoring and Evaluation Risks

* 1. The main risk related to the proposed evaluation methodology is that the random assignment is not respected during program implementation. When the Visible and Tabgible Math pilot (BL-T1019) was implemented, the random assignment was respected through information to all schools and close monitoring during implementation. With this presedent we are hopeful that the random assignment will be respected also for BL-L1018.

#### Monitoring Coordination, Work Plan and Budget

* 1. In terms of monitoring and evaluation activities, the project team will provide continuous support to the MOEYS, organizing monthly meetings on implementation progress and to ensure that agreed indicators are timely met.
  2. As described above, a comprehensive set of monitoring activities and capacity building for such activities, has been integrated in project design and funds have been budgeted accordingly. Additional funding has been allocated whenever baselines, surveys, action-research or impact evaluation designs was judged necessary and outside of the immediate competence or financial means of the MOEYS.

**Table 2. Monitoring Work Plan**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Key monitoring activities / Products per activities** | **Year 1** | | | | **Year 2** | | | | **Year 3** | | | | **Year 4** | | | | **Responsible** | **Cost currency ($)** | **Funding** |
| **T1** | **T2** | **T3** | **T4** | **T1** | **T2** | **T3** | **T4** | **T1** | **T2** | **T3** | **T4** | **T1** | **T2** | **T3** | **T4** | **currency** |
| ***Data Collection*** | | | | | | | | | | | | | | | | | | | |
| Baseline exam design and revision |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Lead Evaluator | 500,000 | BL-L1018 |
| Baseline exam to benchmark participating teachers, principals and students |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Lead Evaluator | BL-L1018 |
| Implement baseline |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Evaluation/Survey supervisor | BL-L1049 and BL-L1018 |
| First intermediate data collection |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Evaluation/Survey supervisor | BL-L1018 and BL-L1049 |
| Second intermediate data collection |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Evaluation/Survey supervisor | BL-L1018 |
| Third intermediate data colection |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Evaluation/Survey supervisor |  |
| Endline exam design and revision |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Lead Evaluator | BL-L1018 |
| Implement end line with teachers, principals and students |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Evaluation/Survey supervisor | BL-L1018 |
| ***Intervention and Research Design*** | | | | | | | | | | | | | | | | | | | |
| Quasi-experimental matching |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Lead Evaluator | 80,000 | BL-L1018 |
| Definition and design of research instruments |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Lead Evaluator | BL-L1018 |
| ***Monitoring*** | | | | | | | | | | | | | | | | | | | |
| Monthly audits of the intensity of the treatments |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Evaluation/Survey supervisor | 100,000 | BL-L1018 |
| ***Analysis*** | | | | | | | | | | | | | | | | | | | |
| Baseline results data cleaning and analysis |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Evaluation/Survey supervisor & Lead Evaluator | 158 | BL-L1018 |
| Baseline analysis for sample balance and randomization of schools |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Lead Evaluator | BL-L1018 |
| Endline exam data cleaning and analysis |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Evaluation/Survey supervisor & Lead Evaluator | BL-L1018 |
| Impact analysis |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Lead Evaluator | BL-L1049 and BL-L1018 |
| **TOTAL COST:** |  |  |  |  |  |  |  |  |  | | | |  | | | |  | **838** |  |

# Evaluation

#### Objectives and Main Evaluation Questions

* 1. The main objective of the EQIP is improving the quality of primary education, and the governance of the Belize education system.
  2. This main objective will be tackled through the following interventions, each one addressing different problems affecting the quality of primary education and each one having a specific objective and impact evaluation stratey: 1) PSTT for future teachers, 2) TCPD for in-service teachers, and 3) the Principal Training.
  3. Therefore, the specific objectives of the impact evaluation are to: 1) assess the impact of the PSTT program on the TEI instructors’ teaching methods for Math, Science, and English subjects and on prospective teachers’ achievement; 2) assess the impact of the TCPD program on in-service teachers’ content knowledge of Math, Science, and English subjects and on students’ academic outcomes in those same subjects; and 3) assess the impact of the PT program on primary school instructional leadership and school management.
  4. In addition to these specific objectives and their resulting impact evaluations, all of which will take place during the lifespan of the EQIP, a long-term ex-post evaluation framework will be designed to enable future assessment of the impact of the PSTT program on prospective teachers’ relative success (i.e. prospective teachers who were trained by PSTT instructors). Although this relative success of prospective teachers from PSTT TEIs will not be able to be observed during the EQIP timeframe, characteristics for both PSTT and non-PSTT prospective teachers can be taken by registering important variables of each incoming cohort (for both PSTT and non-PSTT prospective teachers). Having this repository of data would allow for tracking of PSTT and non-PSTT teachers throughout their educational career, and would also shed light on important variables that could serve as predictors of future success. For example, comparing PSTT and non-PSTT trained teachers one decade into the future might show differences between both groups (types of schools that they serve, average salaries, average academic achievement of their students, etc.).
  5. The main questions that the program evaluation and ex-post evaluation ultimately aim to respond are:
* What is the effect of the PSTT program on the TEI instructors’ teaching methods for Math, Science, and English?
* What is the effect of the PSTT program on prospective teachers’ achievement?
* What is the effect of the TCPD program on in-service teachers’ content knowledge of Math, Science, and English subjects?
* What is the impact of the PT program on primary school management and supervision procedures?
* What is the effect of the TCPD program on students’ academic outcomes in Math, Science, and English subjects?
* What is the effect of the PSTT program on prospective teachers’ future success/achievement?
* What is the effect of the TCPD on secondary education completion rates?

#### Main outcome and impact indicators

* 1. The impact and outcome indicators that will be measured as part of the evaluation of this program include, among others:

|  |  |  |
| --- | --- | --- |
| **Table 3. Outcome and Impact Indicators of Evaluation** | | |
| **Indicator** | **Frequency of Measurement** | **Source of Verification** |
| Proportion of prospective teachers in the targeted TEIs with an overall grade of B or higher on content exam. | Yearly application of Math, Science, and English content instrument (first year includes a baseline) | Program evaluation reports. |
| Proportion of in service primary education teachers in the targeted schools with an overall grade of B or higher on content exam. | Yearly application of Math, Science, and English content instrument (first year includes a baseline) | Program evaluation reports. |
| Proportion of teachers in targeted schools who report that they are not appraised by their principal. | Yearly application of a school principal instrument (first year includes a baseline) | Program evaluation reports. |
| Proportion of school supervision reports in the targeted schools that are made public on MOEY website | Yearly report on number of supervised reports publically available on the website | EMIS |
| Proportion of new male student teacher candidates in Teacher Education Institutes | Yearly, through administrative data | Teacher Education and Development Services (TEDS) |

* 1. In addition to the outcome and impact indicators that will be measured as part of this evaluation study, Table 4 also presents the outcome and impact indicators for the ex post evaluations, which measure among other things the impact that TCPD has on student achievement and the effect that PSTT has on the prospective teacher’s achievements and in the future achievement of their students. The ex-post evaluation would require the identification of funding.

|  |  |  |
| --- | --- | --- |
| **Table 4. Outcome and Impact Indicators of Ex Post Evaluation** | | |
| **Indicator** | **Frequency of Measurement** | **Source of Verification** |
| Proportion of prospective teachers in the targeted TEIs that employ the new methods | Every semester, coded data obtained from video recordings | Ex-post Program evaluation reports |
| Difference of means between Treatment and Control school’s student achievements | Yearly application of the student achievement instruments (Math, Science, and English), including a baseline the first year | Ex-post Program evaluation reports |
| Difference of means between prospective teachers’ achievements and non-prospective teachers’ achievement | Yearly application of content instruments (Math, Science, and English), including a baseline the first year | Ex-post Program evaluation reports |
| Difference of means between prospective teachers’ student achievements and non-prospective teachers’ student achievement | Yearly application of content instruments (Math, Science, and English), including a baseline the first year. | Ex-post Program evaluation reports |

#### Evaluation of Pre-service Teacher Training (PSTT)

##### *Existing knowledge*

* 1. A growing body of evidence indicates teacher is the most important school factor for student learning (Kane et al. 2013; Hanushek 2011; Rivkin et al. 2005; Rockoff 2004). Research suggests that effective teacher professional development programs are hands-on, allow for the analysis in situ of instructional practice, and focus on the development of content-specific teaching skills (Darling-Hammond 2009). In Language Arts, the most effective programs for teaching English combine the development of visual and auditory perceptual skills, vocabulary, and comprehension skills, with phonics instruction and repeated English opportunities (Hattie, 2009). In Science, there is a growing body of literature that supports a shift from teacher centered pedagogical methods to some degree of student inquiry (Healy 1990; Lowery 1998). A recent meta-analysis indicates that teacher-led inquiry-based methodologies are more effective that purely student-led methodologies (Furtak 2012). In Math, comprehensive reviews, such as Hiebert and Grouws (2007) tend to recommend a focus on conceptual understanding and procedural fluency, mathematical argumentations and communication, problem solving and problem posing, and multiple representations and connections.
  2. In addition, important background knowledge is provided by the visible and tangible teacher-led math inquiry model (TLMI) that was successfully piloted in the Belize City District (BL-T1049) and found to have a positive effect on student learning (Hindermann 2014). The teaching approach is defined as structured inquiry, which provides students with the materials and step-by-step instructions for individual investigation and exploration of the concepts being taught. The visible and tangible math model was introduced as a school-wide approach that involved principals, school administrators, teachers, and students. The general training approach was to teach the teachers mathematical concepts in the way they were expected to teach students in their own classrooms: through inquiry and hands on activities which varied considerably based on the concept and level of student. Teachers also received in in-class tutoring and mentoring.

##### *Evaluation Methodology*

* 1. Given the inability to perform a randomized control trial that would allow for evaluating the effects of the PSTT program on the pre-service teachers[[1]](#footnote-1), a quasi-experimental evaluation will be employed. There are some 500 prospective teachers in three TEIs that will not be targeted by the operation. These will be used to construct a comparison group for the approximately 200 prospective teachers that will form part of the intervention.
  2. Prior to the beginning of the PSTT program, a survey will be administered to the pre-service instructors in order to register training methodology knowledge, as well as attitudes and perceptions in relation to their jobs. This instrument (inst\_PSTT\_0) will serve as a baseline. At the end of each year during the duration of the program this same instrument will be applied, beginning with the initial year (inst\_PSTT\_1, inst\_PSTT\_2, etc.). These follow-up surveys will show the change in instructors’ grasp of Math, Science, and English teaching methods, and his/her attitudes and perceptions towards these new methodologies and their importance in training prospective teachers. Also, these follow-ups will allow for a better approximation to the persistence of certain traits that could affect the instructors’ training efficacy and an approximation to the marginal rates of change over time (which will shed light on some additional questions such as: How long do instructors need to be trained in order to observe significant changes in their knowledge, attitudes and perceptions? How persistent over time are potential changes in knowledge, attitudes and perceptions after the initial training of instructors? Does the training need to be repeated at a certain frequency to ensure desired levels of knowledge, attitudes and perceptions?).
  3. A matching approach[[2]](#footnote-2) will be taken to build the control or comparison group, using covariates that will allow for increasing the similarity between treatment (program) and control group. Three levels of covariates will be considered: 1) characteristics of the instructors’ will be used as covariates to match on (level of education, age, institution where his training was received, years of experience, etc.); 2) characteristics of the training institutions (geographical location, accessibility measures, relative ranking, number of trained pre-service teachers per year, class room size, etc.); and 3) characteristics of the pre-service teachers.
  4. Additionally, and as part of the ex-post evaluation, pre-service teachers that are trained by the program’s instructors and those that were selected into the control group should be followed throughout the course of the EQIP loan and even ex-post in order to explore potential differences that might arise such as school placement and student academic achievement levels. This must be done through repeated measurements and surveys of the treatment and control prospective teachers, which will allow for panel data that can later be evaluated through difference-in-difference with multiple measurements and with time series and panel data analytics. See Annex 2 for the methodological and procedural details for differences-in-differences and multiple measurements methods.

#### Evaluation of In-service Teacher Training (TCPD)

##### *Existing knowledge*

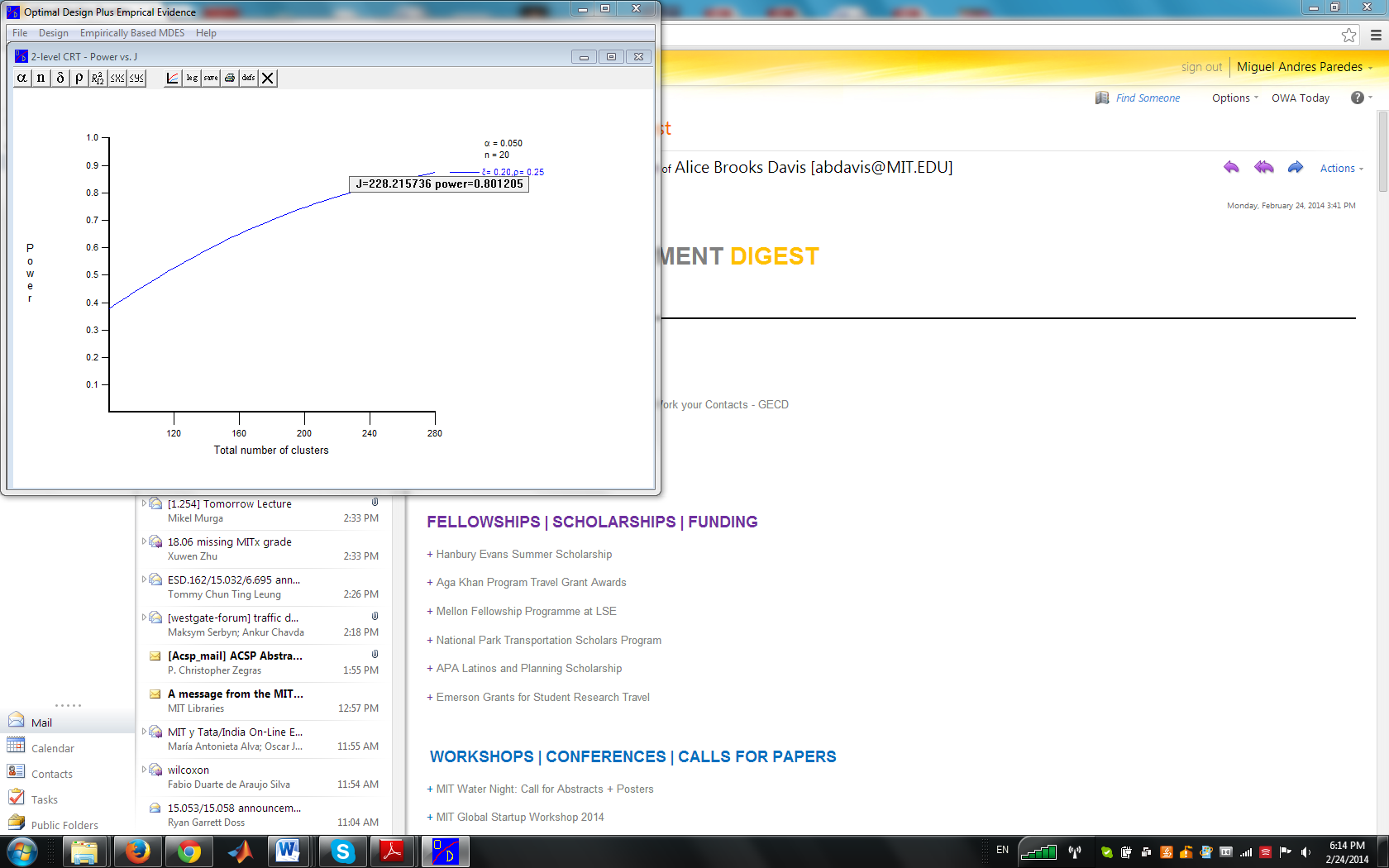
* 1. See section “c” above, as well as the POD.

##### *Evaluation Methodology*

* 1. An RCT will be employed to assess the effect of the in-service teacher training on the knowledge, attitudes and perceptions of teachers towards teaching Math, Science, and English. Indirectly, and as part of the ex-post evaluation, the RCT will also allow for the estimation of the effects of the teacher training program on students’ academic outcomes, particularly in Math, Science, and English. See Annex 2 for the methodological and procedural details of the RCT method. Annex 3 presents the list of treatment schools and control schools after randomization.[[3]](#footnote-3)
  2. The needed sample size to ensure an 80% statistical power (beta = 0.20) are summarized in Table 1, where we have a significance level (alpha) of 0.05, 230 schools must be a part of the experiment (115 Treatment, 115 Control), a minimal detectable effect (MDE) of 0.20, and considering an intra-cluster correlation – rho - of 0.25 (consistent with the rho in other educational training programs). As more information becomes available, these calculations will be updated. Refer to Annex 1 for a detailed explanation of the power calculations and different scenarios analyzed for the different parameters.

Table 1: MDE Scenarios and Power Calculations





#### Evaluation of Principal Training (PT)

##### *Existing knowledge*

* 1. Top performing countries tend to have solid governance mechanisms with quality assurance systems that set specific goals for all actors and make them responsible for achieving them (Hinderman et al 2014; Vegas and Petrow 2008; Vegas and Paglayan 2010). Two cornerstones of strong governence mechanisms are strong principals and solid EMIS.
  2. Research on the role of school principals positively links school leadership with student achievement (Waters et al. 2003), as long as principals are skilled in organization management (Grissom & Loeb 2011) and instructional leadership (Robinson et al. 2008). Case study research shows that high performing education systems invest heavily in developing these skills through hands-on programs for principal professional development such as internships, shadowing of experienced principals, and job-embedded mentoring (Darling Hammond & Rothman 2011). An analysis of high performing education systems suggests that having good principals, while necessary, is not sufficient. These systems have mechanisms in place to ensure that there is enough data in the system to inform improvement (Darling-Hammond 2010, Darling-Hammond & Wentworth 2010). School and student data are used to identify improvement needs and to determine when it is necessary to intervene in underperforming schools. High performing education systems have Education Monitoring Information System (EMIS) that collect, process, organize, and make data available to suit the needs of various types of users, whether at the central level for policy planning, at the district level for the development of district improvement plans, or at the school level to inform teaching (Vegas et al, 2014).

##### *Evaluation Methodology*

* 1. We will employ two strategies to measure the impact of the principal training: an RCT and a randomization inference approach. This dual evaluation approach will be taken because the lack of evidence on principal training programs makes the setting of an appropriate minimum detectable effect (MDE) challenging. That is, to know if we have enough power to evaluate the PT we need to know what the expected effect could be. As we have seen for the TCPD, considering all primary schools in Belize barely provides us with the statistical power that is needed for an RCT when taking an MDE of 0.20. Given that the current sample size and the unknown MDE for principal training effects might prevent us from obtaining valid results through an RCT, the randomization inference approach allows for a rigorous testing of the principal training component by employing simulation techniques and testing a more conservative hypothesis which is called the Sharp Null Hypothesis (Fischer, 1935). See Annex 2 for the methodological and procedural details of the randomization inference method.
  2. Not to overwhelm schools, the principal training is expected to be initiated after the TCPD (one to two academic years later). The temporal difference in the implementation of principal training and the TCPD will prevent the contamination of interventions, increasing the likelihood that program effects might be detected. Prior to initiating the principal training, we will explore if using the same randomization or doing a re-randomization would allow us to detect smaller effect sizes.

#### Economic Analysis

* 1. An ex-ante economic analysis has been conducted during the preparation of the program ([Economic Analysis](http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=38691139)). The most important benefits that were included in the model are: (i) for Component I, an increase in the academic performance, leading to increased retention and expected lifetime earnings of students; and (ii) for Component II, cost savings from decreased consultancy and staff time devoted to information gathering and data entry. An **ex-post economic evaluation**, following the same parameters of the ex-ante evaluation will be conducted. If a re-randomization is done for the principal training (paragraph 3.20), we would be able to do a cost-effectiveness analysis, contrasting principal training with the training of teachers.

#### Coordination, work plan and evaluation budget.

* 1. For the elaboration of the evaluations and the ex-post economic analysis independent consultants and consulting firms (see section on impact evaluation) will be hired with the resources of the program.

**References**

Bloom, Howard S. "The core analytics of randomized experiments for social research." (2006).

Kremer, Michael. "Randomized evaluations of educational programs in developing countries: Some lessons." *American Economic Review* (2003): 102-106.

Fisher, Ronald Aylmer. "The design of experiments." (1935).

Glennerster, Rachel, and Kudzai Takavarasha. *Running Randomized Evaluations: A Practical Guide*. Princeton University Press, 2013.

Greevy, Robert, Jeffrey H. Silber, Avital Cnaan, and Paul R. Rosenbaum. "Randomization inference with imperfect compliance in the ACE-inhibitor after anthracycline randomized trial." *Journal of the American Statistical Association* 99, no. 465 (2004): 7-15.

Ho, Daniel E., and Kosuke Imai. "Randomization Inference With Natural Experiments." *Journal of the American Statistical Association* 101, no. 475 (2006)

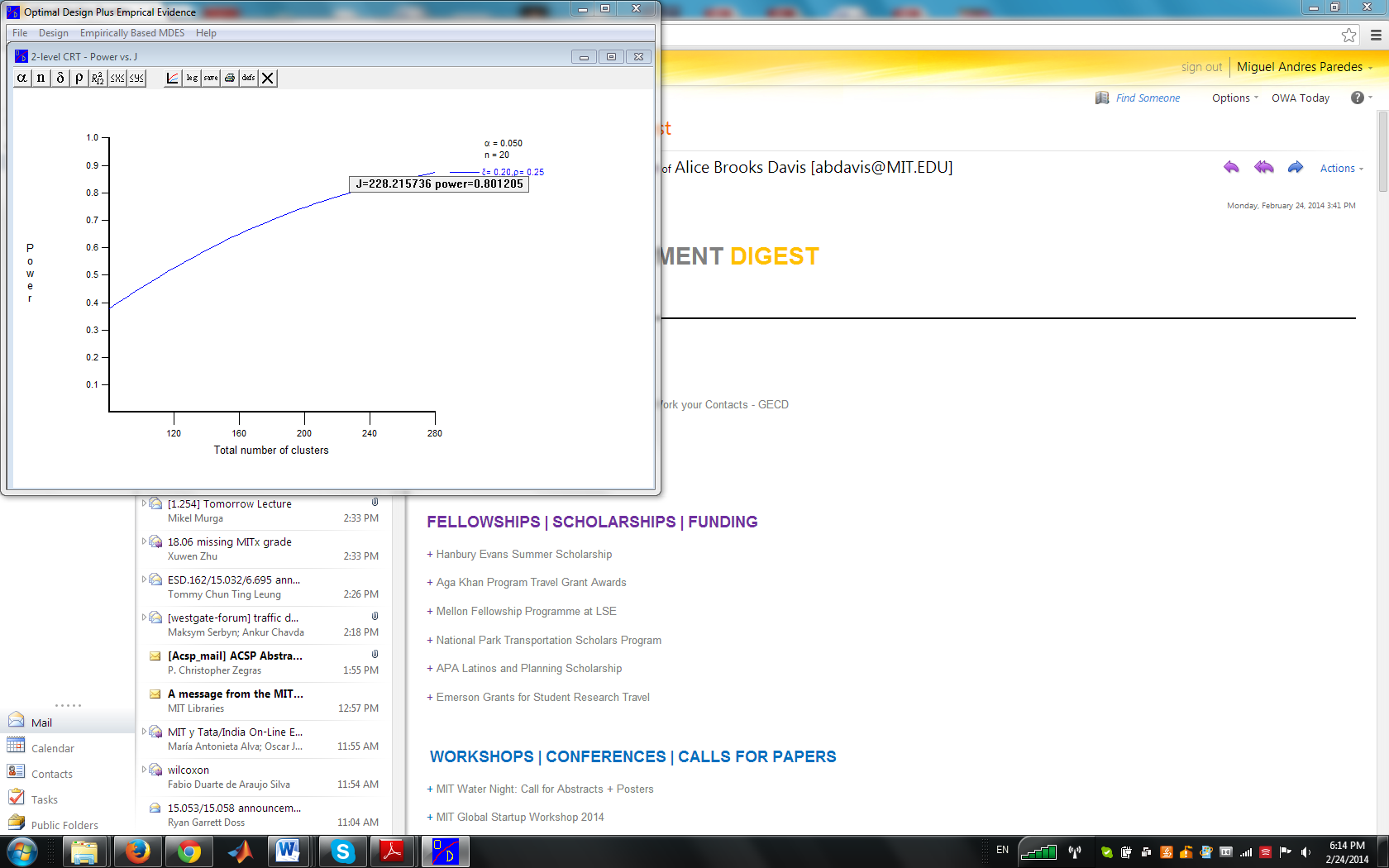
# Annex 1: power calculations

The following Power calculations were realized both in Excel and in Optimal Design considering a simple clustered randomized control sampling scheme.

**Statistical Power Scenarios**



Power calculations where also performed in Optimal Design, using a 2-level outcome in a Clustered Randomized Control Trial:



# Annex 2: Description of the Evaluation Methods to be employed in the eqip

1. Randomized Control Trials

Randomized control trials (RCTs) are the golden norm of causal estimation. In an RCT, an intervention (teacher training program, educational materials, new teachers, etc.) is randomly assigned to a sample of individuals or organizations. Assuming a large enough sample size, balance on observed covariates is achieved, as well as on those that are non-observable. RCTs have been employed in education for decades (Kremer, 2003), and have become more and more popular as they provide rigorous evidence of what works and what does not work in development. See Glennerster, and Kudzai for a practical guide on how to perform RCTs and the ins and outs of them (Glennerster and Kudzai, 2013).

1. Randomization Inference

To have a backup evaluation strategy in case the Principal Training RCT turns out to be underpowered, we will employ a randomization inference impact evaluation. This method is very useful when an intervention has been randomly assigned but the sample size is small enough that there is not enough statistical power to perform a traditional randomized control.

Randomization inference techniques have been around for almost a century. One of the most important variants of this family of methods is called Fisher’s Exact Test, in honor of who is attributed to developing this method (Fisher, 1935). Modern researchers have also applied randomization inference methods, especially in fields such as statistics, economics, and medicine, to name a few (Rubin, 1978; Ho and Imai, 2006; Greevy, Silber, Cnaan, and Rosenbaum, 2004).

Randomization inference techniques differ from traditional impact evaluation techniques in that instead of testing the traditional null and alternative hypothesis which are based on the expected values of the outcomes of interest (H0: E[Y1] = E[Y0]; H1: E[Y1] ≠ E[Y0]) one tests what is called the sharp null or no effect hypothesis (H0: Y1 = Y0; H1: Y1 ≠ Y0), which states that our true observed outcome Average Treatment Effect (ATE) = Y1 – Y0 (where Y1 is, for example, the average math score for treatment schools, and Y0 is the average math score for control schools) is exactly the same as the ATE of all values of Ω, which is the set of all possible randomization realizations (all possible combinations of treatment and control schools). In other words, in order to reject the sharp null hypothesis the observed ATE would have to be much larger than the ATEs derived from all possible combinations of treatment and control subjects.

1. **Matching and Difference-in-Difference**

A quasi-experimental evaluation, such as matching techniques or difference-in-difference (DD) take advantage of the existence of a control group that is selected based on similar characteristics, and a baseline and endline are taken on both groups. By comparing the difference between the endline and the baseline, we obtain the variation on certain outcomes of interest (student achievement levels, content knowledge of teachers, and number of supervision reports uploaded to the school website) for each group, and then compare within groups. We would expect that the treatment group students or teachers would show a larger difference (post minus pre) relative to the control group. This double difference (reason for the DD name) provides an estimator of the average treatment effect (ATE).

In order to improve the control, we will employ a matching technique (the exact technique will depend on the quality of information that is available for the treatment and control schools) that will seek to construct a control group by matching those in the treatment group (pre-service teacher instructors, prospective teachers, etc.) to units of analysis that are very similar on observable variables (age, previous achievement levels, socioeconomic status, geographical location, etc.).

# Annex 3: Randomization Matrix[[4]](#footnote-4)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Randomization Matrix** | | | | | | | | |
| **District** | **PREMIS** | **Primary School Name 2012-13** | **Management** | **U/R** | **Funding** | **Enrollment** | **Teachers** | **Treatment Group** |
| Belize | 10001 | Stella Maris | Government | U | Government | 131 | 26 | T |
| Belize | 10101 | Gales Point Gov't | Government | R | Government | 91 | 6 | C |
| Belize | 10201 | Lucky Strike | Government | R | Government | 65 | 6 | C |
| Belize | 10301 | Crooked Tree Gov't | Government | R | Government | 151 | 8 | T |
| Belize | 10401 | Biscaye Government | Government | R | Government | 141 | 8 | T |
| Belize | 10402 | Hattieville Gov't | Government | R | Government | 341 | 21 | C |
| Belize | 11001 | Holy Redeemer | RC | U | Government Aided | 1044 | 44 | T |
| Belize | 11004 | San Pedro RC | RC | U | Government Aided | 902 | 35 | T |
| Belize | 11007 | St Ignatius | RC | U | Government Aided | 797 | 35 | T |
| Belize | 11008 | St John Vianney | RC | U | Government Aided | 708 | 30 | C |
| Belize | 11011 | St Joseph | RC | U | Government Aided | 919 | 37 | C |
| Belize | 11012 | St Martin de Porres | RC | U | Government Aided | 681 | 28 | T |
| Belize | 11201 | Caye Caulker RC | RC | R | Government Aided | 386 | 15 | C |
| Belize | 11202 | Our Lady of Lourdes | RC | R | Government Aided | 194 | 9 | T |
| Belize | 11402 | Guadalupe RC | RC | R | Government Aided | 86 | 6 | C |
| Belize | 11403 | Our Lady of the Way | RC | R | Government Aided | 612 | 23 | C |
| Belize | 11404 | St Therese RC | RC | R | Government Aided | 102 | 5 | T |
| Belize | 12001 | All Saints | Anglican | U | Government Aided | 618 | 28 | C |
| Belize | 12004 | Queen Sq Ang. | Anglican | U | Government Aided | 715 | 41 | C |
| Belize | 12006 | St John Ang | Anglican | U | Government Aided | 279 | 23 | T |
| Belize | 12008 | St Mary's | Anglican | U | Government Aided | 306 | 20 | C |
| Belize | 12009 | Holy Cross Anglican | Anglican | U | Government Aided | 409 | 19 | T |
| Belize | 12304 | St. Agnes Anglican | Anglican | R | Government Aided | 210 | 13 | C |
| Belize | 13002 | Ebenezer Meth | Methodist | U | Government Aided | 240 | 12 | T |
| Belize | 13004 | St Luke Meth | Methodist | U | Government Aided | 777 | 30 | C |
| Belize | 13005 | Trinity Meth | Methodist | U | Government Aided | 184 | 10 | T |
| Belize | 13006 | Wesley Lower | Methodist | U | Government Aided | 435 | 22 | C |
| Belize | 13008 | Wesley Upper | Methodist | U | Government Aided | 256 | 13 | T |
| Belize | 13202 | Zion Park | Methodist | R | Government Aided | 84 | 4 | C |
| Belize | 13401 | Burrell Boom Meth | Methodist | R | Government Aided | 296 | 14 | C |
| Belize | 14001 | James Garbutt | SDA | U | Government Aided | 232 | 13 | C |
| Belize | 14002 | Ephesus SDA | SDA | U | Government Aided | 142 | 8 | T |
| Belize | 14003 | New Horizon SDA | SDA | U | Government Aided | 321 | 12 | C |
| Belize | 14450 | Hattieville SDA | SDA | R | Government Aided | 49 | 4 | T |
| Belize | 14451 | Ladyville SDA | SDA | R | Government Aided | 278 | 11 | T |
| Belize | 15001 | Button Wood Bay | Nazarene | U | Government Aided | 204 | 10 | T |
| Belize | 16001 | Central Christian | A of God | U | Government Aided | 221 | 9 | T |
| Belize | 17007 | Living Hope Prep | Private | U | Government Aided | 27 | 3 | C |
| Belize | 18460 | Pilgrim Fellowship | Mennonite | R | Government Aided | 112 | 5 | T |
| Belize | 19001 | Bethel | Bethel Assembly | U | Government Aided | 107 | 7 | C |
| Belize | 19002 | Calvary Temple | Pentecostal | U | Government Aided | 217 | 12 | C |
| Belize | 19003 | Grace Primary | Christian Brethren | U | Government Aided | 478 | 18 | T |
| Belize | 19004 | Muslim Community | Islamic Mission | U | Government Aided | 237 | 16 | C |
| Belize | 19005 | Queen St Baptist | Baptist | U | Government Aided | 248 | 13 | C |
| Belize | 19006 | Salvation Army | Salvation Army | U | Government Aided | 209 | 10 | C |
| Belize | 19007 | Unity Presbyterian Primary | Presbyterian | U | Government Aided | 190 | 9 | T |
| Belize | 19080 | YWCA | YWCA | U | Government Aided | 46 | 3 | C |
| Belize | 19095 | Friends Boys School | Friends United | U | Government Aided | 8 | 3 | T |
| Belize | 19301 | Belize Rural Primary School | RC/Anglican | R | Government Aided | 233 | 20 | C |
| Belize | 19401 | Ladyville Evangelical | UECB | R | Government Aided | 318 | 15 | T |
| Belize | 19402 | Pancotto Primary | Methodist Protestant Schools | R | Government Aided | 265 | 11 | T |
| Cayo | 20002 | United Evergreen | Government | U | Government | 625 | 37 | T |
| Cayo | 20003 | Garden City | Government | U | Government | 369 | 20 | T |
| Cayo | 20004 | Kuxlin ha | Government | U | Government | 461 | 20 | C |
| Cayo | 20101 | Iguana Creek Gov't | Government | R | Government | 39 | 3 | C |
| Cayo | 20102 | Los Tambos Gov't | Government | R | Government | 111 | 5 | C |
| Cayo | 20103 | More Tomorrow Gov't | Government | R | Government | 40 | 3 | C |
| Cayo | 20104 | El Progresso | Government | R | Government | 138 | 6 | C |
| Cayo | 20105 | Duck Run 3 - Hidden Paradise | Government | R | Government | 52 | 4 | T |
| Cayo | 20106 | Duck Run 1- New Life Gov't | Government | R | Government | 104 | 5 | T |
| Cayo | 20201 | Buena Vista Gov't | Government | R | Government | 196 | 8 | C |
| Cayo | 20301 | Franks Eddy | Government | R | Government | 122 | 6 | T |
| Cayo | 20401 | Armenia Gov't | Government | R | Government | 400 | 17 | T |
| Cayo | 20402 | St Martin Gov't | Government | R | Government | 654 | 28 | T |
| Cayo | 20403 | St Matthews Gov't | Government | R | Government | 332 | 15 | C |
| Cayo | 20404 | La Garcia | Government | R | Government | 87 | 4 | T |
| Cayo | 21002 | Mt Carmel Primary | RC | U | Government Aided | 983 | 40 | C |
| Cayo | 21005 | Sacred Heart Primary | RC | U | Government Aided | 881 | 35 | C |
| Cayo | 21007 | Santa Elena Primary | RC | U | Government Aided | 978 | 40 | C |
| Cayo | 21008 | Our Lady of Guadalupe | RC | U | Government Aided | 537 | 22 | C |
| Cayo | 21009 | Bishop OP Martin | RC | U | Government Aided | 489 | 22 | T |
| Cayo | 21101 | La Inmaculada RC | RC | R | Government Aided | 181 | 7 | T |
| Cayo | 21102 | Holy Cross RC | RC | R | Government Aided | 76 | 5 | C |
| Cayo | 21103 | St Joseph Duck Run 2 | RC | R | Government Aided | 76 | 3 | T |
| Cayo | 21106 | Monsignor Romero | RC | R | Government Aided | 310 | 13 | T |
| Cayo | 21107 | San Marcos | RC | R | Government Aided | 38 | 4 | C |
| Cayo | 21201 | Cristo Rey RC | RC | R | Government Aided | 152 | 7 | T |
| Cayo | 21202 | San Antonio RC | RC | R | Government Aided | 161 | 7 | T |
| Cayo | 21301 | Santa Familia | RC | R | Government Aided | 289 | 12 | T |
| Cayo | 21401 | Inmaculate Conception | RC | R | Government Aided | 333 | 14 | C |
| Cayo | 21402 | St Jude RC | RC | R | Government Aided | 274 | 11 | C |
| Cayo | 21403 | St Joseph Cotton Tree | RC | R | Government Aided | 441 | 16 | C |
| Cayo | 21404 | St Michaels RC | RC | R | Government Aided | 353 | 14 | C |
| Cayo | 21405 | Our Lady of Fatima | RC | R | Government Aided | 255 | 12 | T |
| Cayo | 21406 | St Margaret Mary | RC | R | Government Aided | 360 | 16 | T |
| Cayo | 21407 | St Edmund Campion | RC | R | Government Aided | 440 | 17 | C |
| Cayo | 21408 | St Francis Xavier RC | RC | R | Government Aided | 187 | 8 | C |
| Cayo | 21409 | St Martin de Porres RC | RC | R | Government Aided | 107 | 5 | T |
| Cayo | 21410 | Succotz RC | RC | R | Government Aided | 301 | 16 | C |
| Cayo | 21411 | St Vincent Pallotti | RC | R | Government Aided | 204 | 7 | C |
| Cayo | 21412 | St Peters RC | RC | R | Government Aided | 17 | 3 | T |
| Cayo | 22001 | St Andrew | Anglican | U | Government Aided | 421 | 19 | C |
| Cayo | 22002 | St. Anns Anglican | Anglican | U | Government Aided | 151 | 7 | T |
| Cayo | 22401 | St Hilda's | Anglican | R | Government Aided | 203 | 8 | T |
| Cayo | 22402 | St Barnabas Ang | Anglican | R | Government Aided | 103 | 6 | C |
| Cayo | 24001 | Eden SDA | SDA | U | Government Aided | 438 | 17 | C |
| Cayo | 24002 | El Shaddai | SDA | U | Government Aided | 123 | 7 | C |
| Cayo | 24003 | Hills of Promise | SDA | U | Government Aided | 290 | 12 | C |
| Cayo | 24400 | Bullet Tree SDA | SDA | R | Government Aided | 142 | 8 | C |
| Cayo | 24450 | Billy White SDA | SDA | R | Government Aided | 130 | 5 | C |
| Cayo | 25001 | Howard Smith | Nazarene | U | Government Aided | 491 | 18 | T |
| Cayo | 25002 | Faith Naz | Nazarene | U | Government Aided | 425 | 19 | T |
| Cayo | 25401 | Raymond Sheppard Naz (Roaring Creek Naz) | Nazarene | R | Government Aided | 371 | 19 | T |
| Cayo | 25402 | Victorious Naz | Nazarene | R | Government Aided | 238 | 11 | T |
| Cayo | 26101 | Valley of Peace Christian | A of God | R | Government Aided | 230 | 10 | T |
| Cayo | 29002 | Arms of Love Primary | Evangelical | U | Government Aided | 111 | 5 | C |
| Cayo | 29201 | San Antonio United Pent. | Pentecostal | R | Government Aided | 232 | 9 | C |
| Cayo | 29401 | Ontario Christian | Bze Faith Mission | R | Government Aided | 209 | 13 | T |
| Corozal | 30401 | Calcutta Gov't | Government | R | Government | 97 | 5 | T |
| Corozal | 30402 | Chan Chen Gov't | Government | R | Government | 173 | 8 | T |
| Corozal | 30403 | Paraiso Gov't | Government | R | Government | 195 | 10 | C |
| Corozal | 30404 | Ranchito Gov't | Government | R | Government | 226 | 10 | C |
| Corozal | 30405 | San Antonio Gov't | Government | R | Government | 53 | 3 | C |
| Corozal | 30406 | San Pedro Gov't | Government | R | Government | 94 | 5 | T |
| Corozal | 31002 | St Francis Xavier | RC | U | Government Aided | 490 | 22 | T |
| Corozal | 31003 | Mary hill RC | RC | U | Government Aided | 445 | 20 | T |
| Corozal | 31101 | Copper Bank | RC | R | Government Aided | 111 | 5 | T |
| Corozal | 31102 | Chunox RC | RC | R | Government Aided | 242 | 11 | T |
| Corozal | 31103 | Progresso RC | RC | R | Government Aided | 195 | 9 | C |
| Corozal | 31104 | Sarteneja "La Immaculada" | RC | R | Government Aided | 173 | 8 | C |
| Corozal | 31401 | Our Lady of Guadalupe | RC | R | Government Aided | 250 | 10 | C |
| Corozal | 31402 | Buena Vista Rc | RC | R | Government Aided | 82 | 4 | T |
| Corozal | 31403 | Caledonia RC | RC | R | Government Aided | 314 | 11 | T |
| Corozal | 31404 | Concepcion RC | RC | R | Government Aided | 124 | 5 | C |
| Corozal | 31405 | Cristo Rey RC | RC | R | Government Aided | 146 | 7 | C |
| Corozal | 31406 | Libertad RC | RC | R | Government Aided | 92 | 5 | T |
| Corozal | 31407 | Lousiville RC | RC | R | Government Aided | 154 | 6 | C |
| Corozal | 31408 | Patchakan RC | RC | R | Government Aided | 261 | 10 | T |
| Corozal | 31409 | San Joaquin RC | RC | R | Government Aided | 191 | 9 | T |
| Corozal | 31410 | San Narciso | RC | R | Government Aided | 506 | 20 | C |
| Corozal | 31411 | San Victor RC | RC | R | Government Aided | 207 | 8 | T |
| Corozal | 31412 | Santa Clara/San Roman | RC | R | Government Aided | 266 | 10 | C |
| Corozal | 31413 | Xaibe | RC | R | Government Aided | 285 | 11 | T |
| Corozal | 31499 | Fireburn RC | RC | R | Government Aided | 5 | 2 | C |
| Corozal | 32001 | St Pauls Ang | Anglican | U | Government Aided | 159 | 9 | T |
| Corozal | 33001 | Czl Meth | Methodist | U | Government Aided | 492 | 18 | T |
| Corozal | 33401 | Libertad Meth | Methodist | R | Government Aided | 167 | 6 | T |
| Corozal | 34001 | Chrisltiline Gill | SDA | U | Government Aided | 237 | 12 | T |
| Corozal | 34101 | Chunox SDA | SDA | R | Government Aided | 119 | 6 | C |
| Corozal | 34400 | Libertad SDA | SDA | R | Government Aided | 138 | 8 | C |
| Corozal | 34401 | calcutta SDA | SDA | R | Government Aided | 166 | 8 | T |
| Corozal | 34403 | Progresso Zills SDA | SDA | R | Government Aided | 103 | 5 | C |
| Corozal | 34410 | Santa Clara SDA | SDA | R | Government Aided | 55 | 5 | T |
| Corozal | 35001 | Czl Naz | Nazarene | U | Government Aided | 115 | 5 | T |
| Corozal | 35101 | Sarteneja Naz | Nazarene | R | Government Aided | 165 | 8 | C |
| Corozal | 36401 | Christian School AOG | A of God | R | Government Aided | 70 | 5 | C |
| Corozal | 39001 | Czl Church of Christ | Church of Christ | U | Government Aided | 168 | 9 | C |
| Corozal | 39402 | Concepcion Presbyterian | Presbyterian | R | Government Aided | 148 | 8 | T |
| Orange Walk | 40001 | Lousiana Gov't | Government | U | Government | 986 | 47 | C |
| Orange Walk | 40101 | Indian Church Gov't | Government | R | Government | 46 | 3 | C |
| Orange Walk | 40102 | Santa Cruz Gov't | Government | R | Government | 52 | 4 | C |
| Orange Walk | 40103 | Santa Martha Gov't | Government | R | Government | 157 | 6 | T |
| Orange Walk | 40104 | Fire Burn Gov't | Government | R | Government | 33 | 3 | C |
| Orange Walk | 40105 | San Carlos Gov't | Government | R | Government | 42 | 3 | T |
| Orange Walk | 40401 | Carmelita Gov't | Government | R | Government | 354 | 16 | C |
| Orange Walk | 40402 | Chan Pine Ridge Gov't | Government | R | Government | 84 | 5 | C |
| Orange Walk | 40403 | San Jose Gov't | Government | R | Government | 456 | 19 | C |
| Orange Walk | 40404 | Trinidad Gov't | Government | R | Government | 91 | 6 | T |
| Orange Walk | 40405 | Trial Farm Gov't | Government | R | Government | 902 | 39 | T |
| Orange Walk | 40406 | San Pablo Gov't | Government | R | Government | 129 | 7 | T |
| Orange Walk | 41003 | La Inmaculada RC | RC | U | Government Aided | 945 | 38 | C |
| Orange Walk | 41004 | San Francisco RC | RC | U | Government Aided | 455 | 20 | T |
| Orange Walk | 41201 | Our Lady of Fatima | RC | R | Government Aided | 95 | 5 | T |
| Orange Walk | 41202 | San Antonio RC | RC | R | Government Aided | 54 | 4 | C |
| Orange Walk | 41203 | St. Michael's RC (San Felipe) | RC | R | Government Aided | 340 | 13 | C |
| Orange Walk | 41204 | San Roman RC | RC | R | Government Aided | 85 | 5 | C |
| Orange Walk | 41401 | August Pine Ridge | RC | R | Government Aided | 392 | 16 | C |
| Orange Walk | 41402 | Guinea Grass RC | RC | R | Government Aided | 428 | 16 | T |
| Orange Walk | 41403 | Nuevo San Juan | RC | R | Government Aided | 78 | 4 | T |
| Orange Walk | 41404 | San Estevan RC | RC | R | Government Aided | 324 | 13 | T |
| Orange Walk | 41405 | San Jose Nuevo | RC | R | Government Aided | 150 | 9 | C |
| Orange Walk | 41406 | San Lazaro RC | RC | R | Government Aided | 61 | 4 | C |
| Orange Walk | 41407 | San Luis RC | RC | R | Government Aided | 74 | 4 | T |
| Orange Walk | 41408 | San Pablo RC | RC | R | Government Aided | 277 | 12 | C |
| Orange Walk | 41409 | Yo Creek Sacred Heart | RC | R | Government Aided | 175 | 8 | C |
| Orange Walk | 42001 | St. Peters Anglican | Anglican | U | Government Aided | 256 | 18 | C |
| Orange Walk | 44001 | Solomons SDA | SDA | U | Government Aided | 325 | 15 | C |
| Orange Walk | 49001 | Chapel School | UECB | U | Government Aided | 209 | 11 | C |
| Orange Walk | 49003 | New Life Presbyterian | New Life Ministries | U | Government Aided | 203 | 9 | C |
| Orange Walk | 49400 | Compassion UECB | UECB | R | Government Aided | 107 | 5 | T |
| Orange Walk | 49401 | San Lazaro Meth | Meth. Protestant | R | Government Aided | 151 | 9 | C |
| Orange Walk | 49403 | Guinea Grass Pentecostal | Pentecostal | R | Government Aided | 298 | 12 | T |
| Stann Creek | 50001 | Gulisi Community | Government | U | Government | 153 | 8 | T |
| Stann Creek | 50101 | Trio Gov't | Government | R | Government | 332 | 16 | T |
| Stann Creek | 50102 | San Isidro Gov't | Government | R | Government Aided | 141 | 7 | C |
| Stann Creek | 50103 | Independence Primary | Government | R | Government | 821 | 32 | T |
| Stann Creek | 50104 | United Comm. | Government | R | Government | 702 | 28 | C |
| Stann Creek | 50301 | Maya Mopan Comm. | Government | R | Government | 153 | 9 | T |
| Stann Creek | 51002 | Holy Ghost | RC | U | Government Aided | 382 | 22 | C |
| Stann Creek | 51004 | Sacred Heart | RC | U | Government Aided | 712 | 32 | C |
| Stann Creek | 51101 | Nuestra Senora de Guadalupe | RC | R | Government Aided | 103 | 5 | C |
| Stann Creek | 51201 | St Alphonsus | RC | R | Government Aided | 307 | 15 | T |
| Stann Creek | 51301 | San Juan Bosco | RC | R | Government Aided | 347 | 17 | T |
| Stann Creek | 51302 | Richard Quinn | RC | R | Government Aided | 164 | 8 | C |
| Stann Creek | 51303 | Holy Family | RC | R | Government Aided | 328 | 18 | T |
| Stann Creek | 51304 | Our Lady of Bella Vista | RC | R | Government Aided | 899 | 34 | C |
| Stann Creek | 51401 | Holy Angels | RC | R | Government Aided | 361 | 16 | T |
| Stann Creek | 51403 | St Jude | RC | R | Government Aided | 100 | 5 | T |
| Stann Creek | 51404 | St Augustine | RC | R | Government Aided | 184 | 8 | T |
| Stann Creek | 51405 | St Paul | RC | R | Government Aided | 108 | 5 | T |
| Stann Creek | 51406 | Fabian Cayetano | RC | R | Government Aided | 169 | 8 | C |
| Stann Creek | 52001 | Christ the King | Anglican | U | Government Aided | 216 | 12 | C |
| Stann Creek | 52201 | St Johns Memorial | Anglican | R | Government Aided | 179 | 12 | C |
| Stann Creek | 52402 | St Matthews | Anglican | R | Government Aided | 244 | 13 | C |
| Stann Creek | 53001 | Epworth Methodist | Methodist | U | Government Aided | 247 | 12 | T |
| Stann Creek | 53201 | Sittee River Meth | Methodist | R | Government Aided | 66 | 4 | T |
| Stann Creek | 53401 | Hope Creek Meth | Methodist | R | Government Aided | 283 | 17 | C |
| Stann Creek | 53402 | Silk Grass Meth | Methodist | R | Government Aided | 313 | 14 | T |
| Stann Creek | 54000 | Shiloh SDA | SDA | R | Government Aided | 131 | 6 | C |
| Stann Creek | 54001 | Zion SDA | SDA | U | Government Aided | 110 | 7 | C |
| Stann Creek | 56001 | Solid Rock Acad. | A of God | U | Government Aided | 188 | 8 | T |
| Stann Creek | 56302 | Red Bank Christian | A of God | R | Government Aided | 326 | 17 | T |
| Stann Creek | 59401 | Light of the the Valley | Baptist | R | Government Aided | 259 | 13 | T |
| Toledo | 60101 | Na Luum Ca | Government | R | Government | 14 | 2 | C |
| Toledo | 60102 | Crique Jute | Government | R | Government | 55 | 3 | C |
| Toledo | 60103 | Midway Gov't | Government | R | Government | 89 | 4 | C |
| Toledo | 60104 | Golden Stream | Government | R | Government | 145 | 7 | C |
| Toledo | 60106 | Graham Creek | Government | R | Government | 37 | 2 | C |
| Toledo | 60201 | Laguna Gov't | Government | R | Government | 66 | 4 | C |
| Toledo | 60202 | San Felipe Gov't | Government | R | Government | 108 | 6 | T |
| Toledo | 60203 | Medina Bank | Government | R | Government | 74 | 3 | T |
| Toledo | 60204 | Santa Ana Gov't | Government | R | Government | 84 | 4 | C |
| Toledo | 60205 | Mabil Ha | Government | R | Government | 48 | 3 | C |
| Toledo | 61002 | St Peter Claver | RC | U | Government Aided | 755 | 34 | C |
| Toledo | 61003 | St Benedict RC | RC | U | Government Aided | 236 | 9 | T |
| Toledo | 61101 | Aguacate RC | RC | R | Government Aided | 106 | 5 | T |
| Toledo | 61102 | St Joseph (Barranco) | RC | R | Government Aided | 34 | 3 | T |
| Toledo | 61103 | St John the baptist | RC | R | Government Aided | 71 | 3 | C |
| Toledo | 61104 | Corazon Creek | RC | R | Government Aided | 61 | 3 | T |
| Toledo | 61105 | Sacred Heart | RC | R | Government Aided | 86 | 4 | T |
| Toledo | 61106 | Our Lady of Sorrows | RC | R | Government Aided | 147 | 6 | T |
| Toledo | 61107 | Jalacte | RC | R | Government Aided | 247 | 9 | T |
| Toledo | 61109 | Machakilha | RC | R | Government Aided | 31 | 2 | T |
| Toledo | 61110 | St Marks RC | RC | R | Government Aided | 90 | 4 | C |
| Toledo | 61111 | San Benito Poite | RC | R | Government Aided | 148 | 7 | T |
| Toledo | 61112 | San Jose RC | RC | R | Government Aided | 214 | 9 | T |
| Toledo | 61113 | San Marcos RC | RC | R | Government Aided | 201 | 8 | T |
| Toledo | 61114 | San Vicente | RC | R | Government Aided | 142 | 6 | C |
| Toledo | 61115 | Santa Cruz RC | RC | R | Government Aided | 119 | 5 | T |
| Toledo | 61116 | Santa Elena Rc | RC | R | Government Aided | 72 | 3 | T |
| Toledo | 61117 | Santa Teresa | RC | R | Government Aided | 89 | 5 | T |
| Toledo | 61118 | Sundaywood | RC | R | Government Aided | 110 | 5 | T |
| Toledo | 61119 | San Lucas RC | RC | R | Government Aided | 45 | 2 | T |
| Toledo | 61201 | Blue Creek RC | RC | R | Government Aided | 97 | 4 | C |
| Toledo | 61202 | Indian Creek | RC | R | Government Aided | 205 | 8 | C |
| Toledo | 61203 | San Francisco de Jeronimo | RC | R | Government Aided | 130 | 6 | T |
| Toledo | 61205 | Silver Creek RC | RC | R | Government Aided | 135 | 5 | T |
| Toledo | 61401 | Big Falls | RC | R | Government Aided | 386 | 16 | C |
| Toledo | 61402 | St Phillip | RC | R | Government Aided | 27 | 2 | C |
| Toledo | 61403 | Little Flower | RC | R | Government Aided | 212 | 9 | T |
| Toledo | 61404 | San Luis RC | RC | R | Government Aided | 325 | 14 | T |
| Toledo | 61405 | San Miguel RC | RC | R | Government Aided | 148 | 6 | T |
| Toledo | 61406 | San Pedro Columbia | RC | R | Government Aided | 447 | 19 | C |
| Toledo | 62101 | St. Cuthbert's | Government | R | Government Aided | 8 | 2 | C |
| Toledo | 62102 | St Stephen Ang | Anglican | R | Government Aided | 68 | 4 | C |
| Toledo | 63001 | Punta Gorda Meth | Methodist | U | Government Aided | 179 | 10 | T |
| Toledo | 63401 | Forest Home Meth | Methodist | R | Government Aided | 152 | 9 | C |
| Toledo | 63402 | Mafredi Meth. | Methodist | R | Government Aided | 78 | 3 | T |
| Toledo | 64000 | Bethel SDA | SDA | U | Government Aided | 128 | 8 | T |

1. Randomizing the training is not feasible; low sample size – number of training centers - precludes sufficient statistical power; and there is foreseeable inability to avoid contamination of experimental groups [↑](#footnote-ref-1)
2. Depending on sample size and the institutional arrangements of the Training Centers, the specific type of Matching strategy will be defined (Propensity Score Matching, Simple Matching on Covariates, etc.) [↑](#footnote-ref-2)
3. The list is preliminary as we may re-randomized based on baseline results to increase the power of the experiment. [↑](#footnote-ref-3)
4. To increase the power of the experiment a re-randomization may be conducted based on baseline results. [↑](#footnote-ref-4)