

# School Reorganization Reforms: The Case of School Networks in Colombia

Gregory Elacqua  
Fabio Sanchez  
Humberto Santos

# School Reorganization Reforms: The Case of School Networks in Colombia

Gregory Elacqua  
Fabio Sanchez  
Humberto Santos

Cataloging-in-Publication data provided by the  
Inter-American Development Bank

Felipe Herrera Library

Elacqua, Gregory M., 1972-

School reorganization reforms: the case of school networks in Colombia / Gregory  
Elacqua, Fabio Sánchez, Humberto Santos.

p. cm. — (IDB Working Paper Series ; 1044)

Includes bibliographic references.

1. School management and organization-Colombia. 2. Educational change-Colombia.

3. Academic achievement-Colombia. I. Sánchez, Fabio. II. Santos, Humberto. III.

Inter-American Development Bank. Education Division. IV. Title. V. Series.

IDB-WP-1044

<http://www.iadb.org>

Copyright © 2019 Inter-American Development Bank. This work is licensed under a Creative Commons IGO 3.0 Attribution-NonCommercial-NoDerivatives (CC-IGO BY-NC-ND 3.0 IGO) license (<http://creativecommons.org/licenses/by-nc-nd/3.0/igo/legalcode>) and may be reproduced with attribution to the IDB and for any non-commercial purpose, as provided below. No derivative work is allowed.

Any dispute related to the use of the works of the IDB that cannot be settled amicably shall be submitted to arbitration pursuant to the UNCITRAL rules. The use of the IDB's name for any purpose other than for attribution, and the use of IDB's logo shall be subject to a separate written license agreement between the IDB and the user and is not authorized as part of this CC-IGO license.

Following a peer review process, and with previous written consent by the Inter-American Development Bank (IDB), a revised version of this work may also be reproduced in any academic journal, including those indexed by the American Economic Association's EconLit, provided that the IDB is credited and that the author(s) receive no income from the publication. Therefore, the restriction to receive income from such publication shall only extend to the publication's author(s). With regard to such restriction, in case of any inconsistency between the Creative Commons IGO 3.0 Attribution-NonCommercial-NoDerivatives license and these statements, the latter shall prevail.

Note that link provided above includes additional terms and conditions of the license.

The opinions expressed in this publication are those of the authors and do not necessarily reflect the views of the Inter-American Development Bank, its Board of Directors, or the countries they represent.



# School reorganization reforms: The case of school networks in Colombia

*Gregory Elacqua*

*Education Division, Social Sector Department  
Inter-American Development Bank*

*Fabio Sánchez*

*Department of Economics, Universidad de Los Andes*

*Humberto Santos*

*Education Division, Social Sector Department  
Inter-American Development Bank*

## Abstract

To contribute to the debate about the reorganization of the public-school supply, in this paper we analyze a reform introduced in Colombia in 2001 that merged several independent small schools into a single educational institution, with the same name, administration, educational project and school principal. Specifically, we estimate the differences in student achievement and measures of teacher characteristics and technological infrastructure between school sites belonging to a multi-site institution with single-site schools. Our results suggest that there are no differences in standardized test scores, but at the same time, we found that school sites belonging to multi-site schools, especially those in larger networks (more than 6 sites) and located far away from the main site of the school, tend to have younger teachers that earn lower salaries and are more likely to have a temporary contract. We also find evidence that more isolated sites from large-sized schools have less of a probability to have access to the Internet and a computer room than single-site schools. From the point of view of public policy, these results provide suggestions of potential reforms that should be implemented to increase cooperation between sites within the same school.

**Keywords:** school reorganization, Colombia, educational achievement

**JEL Classification:** I210, I240, I280

## Introduction

Due to demographic, economic and political trends, small schools have become a pressing problem in many countries and regions. Because these generally face higher costs per student, school networks with a large number of small schools tend to be expensive to operate (Ares, 2014). In many education systems, the solution has been to close small schools and replace them with larger schools (Abu-Ghaida, Alonso, and Sánchez, 2011; Ares, 2013). However, in some situations, school consolidation or restructuring can be difficult to implement, especially when families do not have options available or when transportation

costs are too high (Elacqua et al., 2012). For example, in many rural and remote areas with low population density, schools are facing declining enrollments. Given the geographic location of these schools, most cannot attract more students, and consolidation may be problematic for different reasons such as travel distances and lack of adequate facilities (Ares, 2014).

Another policy that some systems have adopted is to foster cooperation between schools, in order to reduce costs and increase efficiency. Specifically, school systems have created clusters of sites, where several independent schools are managed by a single administration. Advocates argue that this policy could improve the efficiency of school networks, generating economies of scale, maintaining geographical coverage and avoiding the closure of small rural schools. On the other hand, skeptics argue that, in this model, headquarter schools could utilize most of the network's resources, increasing the inequity in the allocation of inputs and resources, and that coordinating the functioning of the cluster is more difficult, and introduces higher costs, when the cluster is composed of many institutions and when the distance between schools in the network is significant.

In 2001, the Colombian government instituted a reorganization process that resulted in the merging of several small schools into a single institution, with the same name, administration, educational project and budget (Corpoeducación, 2004; 715 Law of 2001). The reform had four main objectives: (i) guarantee school attendance at all levels of basic education; (ii) promote school retention, by avoiding movements of students from one site to another; (iii) improve student learning and reduce repetition, by following the same institutional educational project, and (iv) increase efficiency through a more intensive use of physical infrastructure, materials, and equipment.

In this paper we examine the school reorganization reform that Colombia instituted in 2001. Specifically, we estimate differences in educational outcomes measured by results on the SABER test and measures of schooling inputs, comparing school sites belonging to a multi-site institution with schools functioning independently (single-site schools). Although there are several educational systems that have introduced school cluster and network reforms, there is scant evidence on the impact of these policies on student outcomes. Colombia's school reorganization reform provides an interesting context to explore this topic. The national scope of the reform and the availability of data at the school site level provide a unique opportunity to examine this reform. Moreover, the debate about school reorganization is a hot topic in Latin America, because several systems in the region are considering policies to optimize the school supply in rural and isolated zones. For example, in Peru, the Ministry of Education recently approved guidelines for the organization and operation of the Rural Educational Networks (RER) to strengthen the management of basic education institutions located in rural areas. In Chile, a recent study commissioned by the Ministry of Education recommends significant changes to the per pupil voucher system to reduce the pressure on the financial viability of small and rural schools, especially during a period of marked demographic decline. In Ecuador, the government recently announced that it would reverse a rural school closure policy.

This paper is organized as follows. In section 1 we review the literature about the reorganization of school supply and school networks. Section 2 describes the reform in Colombia. In section 3 we introduce the

econometric strategy and the data. Section 4 presents descriptive statistics and section 5 describes the results. Finally, section 6 discusses the findings and presents some policy implications.

## 1. Literature

Over the past decades, the set of policies school systems have adopted to face the challenge of small and isolated schools has expanded beyond merging or closing schools. There is growing interest in developing informal and formal co-operation between schools, a focus on the expansion or reduction of specific educational services within schools, and the reorganization of specific grade levels. School systems have developed different models of cooperation. For instance, the joint provision of specialized educational services or curricula, sharing human resources, facilities and infrastructure, jointly purchasing materials or services, coordinating student transportation, or making professional development training available to teachers from multiple schools.

There are two main models, which differ in the level of autonomy of the cooperating units and the intensity of collaboration (OECD, 2017). In the first model, a group of independent schools cooperate and share resources. For example, in Belgium (Flemish Community), the government provided incentives in the form of additional staff resources that can be shared between schools that belong to an association. These associations are free to adjust the scope of their collaboration based on their respective needs, ranging from communities with low-intensity co-operation on selected issues to those that share a wide range of services and resources. Another example of this model are the centers for specialized services and teacher collaboration. For example, in Estonia, the regional counselling centers have centralized the provision of specialized services related to the diagnosis and accommodation of special educational needs of multiple schools in the region, thus allowing them to be provided at an efficient scale. Another example is in Chile, where “rural micro-centers” (*microcentros rurales*) provide teachers in rural areas with a space to meet, to collaborate, and to share best practices to address their common challenges<sup>1</sup> (OECD, 2017).

In the second model, a group of schools are organized as a cluster, under a consolidated administration (OECD, 2017). Giordano (2008) introduced a typology of different models, based on the relations between the schools in the network and the way in which the clusters are created, distinguishing between bottom-up and top-down, voluntary vs. mandatory, selective vs. universal, high- vs. low-intensity cooperation approaches, financially autonomous vs. financially supported, and between clusters that serve primarily as tools for external control vs. those that promote internal development.

Advocates of these policies argue that the joint administration of multiple schools could improve the efficiency of school networks and the capacity to provide education, generating economies of scale, maintaining geographical coverage and avoiding the closure of small rural schools. For example, a group of schools can share their equipment and infrastructure, or motivate high-quality teachers to remain in rural areas, offering them better opportunities for development and a wider professional community (OECD, 2017). At the same time, economic theory suggests several possible reasons why costs (measured

---

<sup>1</sup> For more information about *microcentros*, see <https://rural.mineduc.cl/el-microcentro/>

per pupil) might vary with school size. Some authors have maintained that there may be economies or diseconomies of scale in schooling (Andrews, Duncombe and Yinger, 2002). For instance, costs may decline with size as the fixed costs of schools are spread over a larger student body. Fixed costs might include the physical infrastructure of the school as well as personnel, such as principals, or other inputs, such as library books. The key is that these inputs are, in some measure, indivisible. Alternatively, economies of scale may reflect the gains from specialization and division of labor, for example, if teachers are able to specialize in offering courses in their areas of expertise (Stiefel et al, 2009).

Despite the expected positive effects, educational integration has presented several challenges (Corpoeducación, 2004; Giordano, 2008). First, skeptics argue that, when several schools form a network, headquarter schools could utilize most of the network's resources, increasing the inequity in the allocation of inputs and resources. This is a risk, especially in those networks where there is a school that concentrates resources and decision making. Second, critics are also be concerned that the newly formed networks become a sum of the weaknesses that exponentially increase the problems that each of the integrated institutions face. Third, integration may have negative impacts on social capital and cohesion in the surrounding communities, due to the loss of autonomy of the local school (Ares, 2014). For example, in a study on school consolidation in the state of Arkansas, Nitta et al. (2010) found that, teachers and parents report a reduction in the interaction with each other. After consolidation, the school authority is perceived by parents as being more distant, centralized, and concentrated. The larger distance to the school organization and to decision-makers makes interaction costlier and reduces the possibility that parents will participate in school activities (Strang, 1987). Finally, coordinating cluster activities is more difficult when the cluster is composed of many institutions and when the distance between schools in the network is significant. Giordano (2008) shows that large clusters can have coordination problems which reduce the cooperation between schools and make the supervision and support of the network difficult. Coordination costs (e.g. transportation and communication) can also create diseconomies of scale because they limit the ability of principals (or districts) to manage a large school network or generate congestion in the utilization of fixed resources.

Portugal and England have adopted school cluster policies. In 2005/06, Portugal, implemented a reform to consolidate schools into networks to address inefficiency and drastic regional inequalities among small and remote schools. Prior to the reform, rural areas had predominately small schools with poor infrastructure and low performance while schools in urban areas were often overcrowded and relied on double shifts. To address this problem, the Ministry of Education co-operated with local governments and school executive boards to close small, underperforming schools. The government also introduced school clusters to create incentives for cooperation between schools (OECD, 2017; Ares, 2014). A small school cluster typically consists of one headquarter school that offers the second and third cycle of education and 4-5 schools (from 20 to 400 pupils) that offer the first cycle education. Although there is no causal evidence of the impact of the policy on student outcomes, an evaluation based on interviews with a wide range of stakeholders suggests that the change had a positive impact on student retention and learning, reduced the isolation of teachers, optimized the supply of different grade levels, and increased the retention of teachers and the availability of resources for students and teachers (Matthews et al, 2009).

The United Kingdom created school federations to improve results in low-quality small schools. The federation policy merged two or more schools to form a single ‘split - site’ school with one head teacher and governing body. Studies on the impact of federations and collaboration in rural areas suggest that the policy created incentives for schools to pool resources, develop a broader curriculum, and increase professional development opportunities (Chapman, 2015). Chapman and Mujis (2014) used a quantitative methodology involving a matched sample of federated and non-federated schools and multilevel modelling techniques, to explore the impact of federations on student outcomes. They found evidence of a positive impact on overall student attainment, and that this federation effect is greater in federations where higher performing schools partner with lower performing ones. However, there is also evidence that in some cases, small schools in the federation can feel dominated by more centrally located or larger ones. When this occurs, schools have fewer incentives to collaborate because of mistrust (Mujis, 2008). Another potential concern in the reorganization process is the unequal allocation of inputs between rural and urban sites (e.g. teachers).

## 2. Reorganization of the school supply in Colombia

In 2001, the Colombian government implemented a reorganization process that resulted in the merging of several small schools into a single institution. Unlike past efforts, this was the first time that the reorganization became mandatory for schools in the public sector (*escuelas oficiales*)<sup>2</sup>. First, an educational institution, according to Law 715, enacted in 2001, must offer all grades (K-11), grades 1-9 or grades 10-11<sup>3</sup> and belong to a network of two or more school sites that previously functioned as independent schools before the reform (*sedes educativas*). One of the schools in the network operates as headquarters (*sede principal*) and receives the resources from the central government and from territorial entities<sup>4</sup> and employs the administrative staff. The main site’s school principal can assign or reallocate teachers to the rest of the sites (*sedes adscritas*), especially those with temporary contracts, manages the network’s budget and defines the educational project of the school (Econometría, 2013). The reform had four main objectives: (i) guarantee school attendance at all levels of basic education; (ii) increase grade retention, reducing dropout rates that often occur when students transfer to other schools; (iii) improve student learning and decrease repetition, following the same institutional educational project, and (iv)

---

<sup>2</sup> For example, Ley 115 de 1994 (General Education Law) states that schools must have the administrative infrastructure and supports of the pedagogical activity to offer at least preschool and basic education. It also indicates that if they do not offer the complete educational cycle, they should establish agreements with other schools, to guarantee the continuity of the educational process of their students. For details about former attempts to reorganize the public supply, see Corpeducación (2014).

<sup>3</sup> In Colombia, the school system is divided into three levels: *básica primaria*, (grades 1-6), *básica secundaria* (grades 6-9) and *educación media* (grades 10-11). The equivalent in the ISCED classification is primary, lower secondary, and upper secondary respectively.

<sup>4</sup> In Colombia, education is managed by Certified Territorial Entities (*Entidades Territoriales Certificadas* or ETC) that can be Departments (*Departamentos* or Sub-national level) or Municipalities (*Municipios* or local level) (Ley 715 de 2001). Departments and districts were certified automatically. The education in municipalities that are not certified is managed by Departments. In the first stage after the reform that introduced the ETCs, certification was granted to those municipalities that exceeded 100 thousand inhabitants (Brutti, 2014). Currently, municipalities with less than 100 thousand inhabitants can apply to be certified after an evaluation of the technical, administrative, and financial capacity to manage the school network.

improve efficiency through more intensive use of physical infrastructure, materials, equipment, and the allocation of human resources.

The proposals for the reorganization of school supply in a non-certified municipality applying for certification are evaluated jointly by the Department and the corresponding Municipality, in order to determine the relevance of the reorganization of the schools and their implications, especially with the personnel. At this stage, the municipality must collect basic information on its schools and update the directory of institutions. For the approval of the integration process, the department evaluates the following: i) an updated directory of schools and sites; ii) geo-referenced data of the institutions, and iii) a proposal with a technical justification (geographical, pedagogical or administrative reasons) of possible adjustments (Ministry of National Education, 2005). In the case of the certified municipalities the process had to be implemented by the municipality. To help in the implementation process, the Ministry of Education (MEN) produced a booklet that gave some guidelines on the reorganization process, the criteria to be considered, and recommendations about the way to present the changes to school principals, teachers and parents, and students (Econometría, 2013). According to information gathered from interviews with education secretaries, the criterion that prevailed in most of the secretaries was the proximity of the school to other schools that offer grades 0- 9 or 10-11 (Econometría, 2013). However, there is limited quantitative information to analyze how consolidation was implemented in practice.

The reorganization process generated an important change in the structure of the public-school supply.<sup>5</sup> In 2002, before Law 715 was introduced, there were 44,598 educational institutions in the official sector (Piñeros, 2010). In 2004, only three years after the law was enacted, there were only 20,718 official educational institutions, made up of a total of 44,216 sites. In 2016, they reorganized the system into 9,892 educational institutions, with 43,480 individual sites. On the other hand, the reform had an impact on the autonomy of schools, because after the reform, the school principal began to have the legal authority to allocate some inputs (e.g. materials, technology infrastructure, school meals and transportation), funded with the ETC's own resources or with central government transfers<sup>6</sup>, between the different sites of the school. Also, teachers and principals have autonomy to determine course content for core curriculum and have legal authority to select textbooks for the schools. Regarding teachers, school principals have less influence, because applicants decide the specific vacancy they want to fill, based on the results of the teacher contest.<sup>7</sup> Recent evidence shows that there is teacher sorting between schools across SES groups (Elacqua et al, 2018; García et al, 2014). In practice, some ETCs have to fill the teacher positions with provisional appointments that are outside the regulations of the teaching career.

---

<sup>5</sup> Unlike public schools, almost all private schools operation as a single schooling unit.

<sup>6</sup> SGP quality free-of-charge is a central government transfer, created in 2008 to replace the resources that public schools charged to parents. These resources are delivered directly to schools to invest in all spending categories, except staff. School principals are in charge of deciding how to allocate these resources, which represented 2% of total public spending in education in 2016. Also, schools can receive money coming from the ETC's own resources. In 2016, these resources represented 9% of total spending in education (Technical Note IDB, 2018). Finally, schools can receive money from transfers and programs funded by MEN and implemented by territorial entities, but there is not information about the criteria used to allocate those resources.

<sup>7</sup> From 2002, the teachers in the public sector are hired through a competitive public contest. Contests are organized separately in each ETC and candidates must choose the one education authority they wish to apply to. The contest is based on a score system and establishes a ranking among applicants, which determines the order in which successful candidates will be allowed to choose their preferred vacancies (Brutti and Sanchez, 2016).

Recent studies show that the impact on the educational quality of these temporary teachers is negative (Ayala, 2017). This sorting can also be present in the allocation of teachers within schools, because candidates would prefer the main site of the institution and often avoid sites located in rural areas or with problems of accessibility.

There is scant rigorous evidence on the effectiveness of the school reorganization reform in Colombia. *Econometría* (2013) reports that institutions with the more sites (greater than 6) have lower attrition and repetition rates and higher student learning on the SABER<sup>8</sup> 5<sup>th</sup> and 9<sup>th</sup> grade test compared to single-site institutions for the period 2004-2011, although the results depend on the educational level considered. However, the evaluation's identification strategy cannot adequately disentangle the effect of belonging to a multi-site educational institution because the authors did not control for other characteristics of schools that may be correlated with educational outcomes. *Econometría* (2013) also conducted a qualitative study in four territorial entities in Colombia (Bolívar, Cundinamarca, Guaviare y Norte de Santander). The positive aspects of the reorganization, highlighted in the interviews, are: i) facilitating the transitions of students between schools; ii) creating a unified institutional educational project; iii) generating greater integration among the administrative team, teachers, students, and parents from the different sites; iv) improving the quality of teachers and other school staff; v) access to more resources for transportation subsidies; vi) greater access to the library, the computer room and the sports facilities of the main site, for students from other sites. However, the study also highlighted some negative aspects of the reorganization reform: i) the loss of a sense of belonging to the educational community, especially families with students enrolled in the satellite sites; ii) deficiencies in the infrastructure and the quality of some teachers in some of the satellite sites; iii) lack of local autonomy and consultation or participation of the educational institutions in the reorganization process; iv) disregarding the different pedagogical models that were used in the network sites; and v) coordination difficulties due to the distance between the main site and the rest of the sites.

### 3. Methods

#### 3.1. Econometric strategy

To examine the reorganization process in Colombia, we will compare student achievement and schooling inputs of sites belonging to a multi-site institution with those belonging to a school with only one site. The specification of the model is the following:

$$(1) Y_{sij} = \beta_0 + \beta_1 T_j + \beta_2 X_{sij} + \beta_2 Z_j + \varepsilon_s,$$

---

<sup>8</sup> SABER are the standardized tests applied in 3<sup>rd</sup>, 5<sup>th</sup>, 9<sup>th</sup>, and 11<sup>th</sup> grades. The tests evaluate all schools in the system, including public and private, both in urban and rural areas. It focuses on the basic competences that students must develop in the areas of Language and Mathematics. The *Instituto Colombiano para la Evaluación de la Educación* (ICFES) is the institution responsible for the organization and implementation of the tests. More information in <http://www2.icfes.gov.co/instituciones-educativas-y-secretarias/acerca-de-las-evaluaciones/informacion-general>

where  $Y_{sij}$  is the result on the SABER test for 5th or 9th grade, the dropout rate in 5th or 9th grade, or some characteristic of the teachers or the infrastructure of the site  $s$  in the school  $i$  in the territorial entity  $j$ ;  $T_i$  is a set of dummy variables indicating the type of school classified according to the number of sites (1 site, 2-5 sites and 6 or more sites);  $X_{sij}$  is a set of independent variables at the site level and  $Z_j$  is a set of controls related to the territorial entity to which the school belongs. To control for unobservable characteristics, a model with a Certified Territorial Entity fixed effect was also estimated, because the reorganization process has been planned and implemented at that level. In addition, to test for the heterogeneity of the relation,  $T_i$  is interacted with variables representing the relationship of the site with the rest of the sites of the same school. First, with a set of dummy variables measuring the distance from the main site of the school (< 1 km, 2-5 km and > 5 km) and, second, according to the educational levels offered at the site and in the rest of the sites in the educational institution. Specifically, we separate the sites between those that have not experienced changes with the integration process (i.e. they have the next level available in the same site or they don't have the next level available in the school) and those for which the school network makes available lower secondary (i.e. they do not have the next level in the site, but other sites in the same school make it available).

### 3.2. Data

We use the national standardized test 2016 (SABER) to measure student learning. The students are classified in four performance categories: i) advanced: student demonstrates outstanding performance in the competencies expected for the subject and grade evaluated; ii) satisfactory: student shows an adequate performance in the required competences. This is the expected level that all students should reach; iii) minimum: student answers the less complex questions on the test; and insufficient: student does not answer the less complex questions on the test. We use the socioeconomic composition index of school sites constructed by ICFES in 2015, based on the information reported by the students from the socio-demographic questionnaire of the SABER test in 5<sup>th</sup> and 9<sup>th</sup> grades. The index is a function of four variables: parental education, overcrowding in housing, access to sanitary services, and material used for the floors of the dwelling.

Characteristics of school sites and dropout rates come from two sources. First, The Formal Education Study (EDUC), which is an annual statistical census conducted by the National Administrative Department of Statistics (DANE).<sup>9</sup> It is collected for both public and private schools, located in urban and rural areas at the national level, and collects the following information for each site: enrollment, teachers, academic status of students at the end of the previous school year (pass, drop-out, fail) and technology infrastructure. The information is obtained directly from schools. The other source is the information system administered by the Ministry of Education (MEN) (*Resolución 166*). Specifically, from *Anexo 3A* (public teacher census) and *Anexo 6A* (enrollment data). An interesting novelty of this study is that it allows us to calculate the total school dropout rate, including students who drop out between grades

---

<sup>9</sup> More information in <https://www.dane.gov.co/index.php/estadisticas-por-tema/educacion/poblacion-escolarizada/educacion-formal>

(*deserción interanual*). To calculate this dropout rate, we use the panel database built by Sanchez et. al. (2017), which allows us to follow the same student over time. The official data published only considered the students leaving the school during the school year (*deserción intranual*). The georeferenced information of school sites comes from a database built jointly by the Ministry of Education, DANE and the Agustín Codazzi Geographic Institute.

Expenditure data at the ETC level comes from a database collected by the Ministry of Finance and Public Credit (*Formato Único Territorial* or FUT). In this database, all subnational governments (municipalities and departments) provide information regarding: (i) revenue sources (ii) transferred resources and (iii) expenditures categories. This is the main tool that the Ministry of Finance uses to monitor ETC spending in education.

The final database used for the estimations has several restrictions that reduce the total number of school sites. First, the specifications using the SABER results as the dependent variable are restricted only to those sites with 6 or more students who take the test, because that is the threshold used by ICFES to present valid results at the site level (Instituto Colombiano para la Evaluación de la Educación, 2016)<sup>10</sup>. We imposed the same restriction for the data on dropout rates. On the other hand, in the specifications for teacher characteristics and technology inputs, we use the whole sample of schools. Second, given that SABER 2015 socioeconomic level data are not available for all schools, there is a high percentage of missing values, which significantly reduces the number of observations available to estimate the model<sup>11</sup>. Third, given some problems detected in the geographic coordinates of some sites, we drop sites located more than one hundred kilometers from the main site of the school (according to the estimated distance calculated with the coordinates and those located more than 350 km away from the main building of the municipal mayor's office<sup>12</sup>. Finally, the analysis is restricted only to public schools (*escuelas oficiales*), since the reorganization policy was implemented in this sector. Moreover, almost all private schools operate as a single unit.

---

<sup>10</sup> The report with the instructions to interpret results from SABER 5<sup>th</sup> and 9<sup>th</sup> grade states: "For schools or school sites that have less than six (6) students evaluated in an area and grade, a report of the results is presented that corresponds to the distribution of the number of students classified in each of the performance levels". In the appendix we present a table comparing the sample of sites used in the estimation for SABER 5 Language (Restricted) with the unrestricted sample. As expected, in the restricted sample school sites are less likely to belong to large-sized schools, larger, less probably to be single-teacher, and they have a higher percentage of students in the traditional model of teaching and more probability of function in double-shift.

<sup>11</sup> For fifth grade, 38% of school sites that have information on test scores do not have socioeconomic information on students. On the other hand, for ninth grade, this figure is 18%. In the Table A1 in the appendix, we present descriptive statistics comparing the sample used for the SABER 5 estimation (Table 5) with and without controlling for SES. The results show that there are no significant differences between both samples.

<sup>12</sup> Although according to our knowledge, there is no specific restriction on the maximum distance to which a site can be from the main site, we consider 100 km the threshold to define that school site was not well georeferenced, because it is difficult to assume that two sites located at that distance may belong to the same school. We tested a small sample of schools to check the location of the school (based on websites, maps of the municipality and other sources) and compare it with the location associated with the coordinates. We found that a high percentage of these schools were not well georeferenced. We used the same argument for the distance to the main building of the municipality. Only 8% of school sites are discarded when these restrictions are imposed.

#### 4. Descriptive statistics

Table 1 shows the distribution of public educational institutions and sites, according to the number of school sites. One third of the schools are single-site, 38.7% correspond to medium-sized institutions (2-5 sites), and 28% are large-sized institutions (6 sites or more). At the site level, 7.6% of the sites belong to single-site schools, 28.5% to medium-sized schools, and 63.9% to large-sized schools.

Tables 2 and 3 and Figures 1 and 2 present some characteristics of the schools, to show the heterogeneity that exists within multi-site schools. First, Table 2 shows that the reform increased the percentage of schools that offer the complete cycle (i.e. preschool, primary, lower secondary and upper secondary). In medium-sized institutions, 83% offer all grades, while in large-sized institutions 75.3%. On the other hand, in the single-site schools, only the 38.7% has the complete cycle and almost 40% only offer preschool and primary. Regarding the location of the sites, Table 3 shows that a high percentage of the sites within a school are located in the same area (urban or rural). In medium-sized schools, only 10.4% combine urban and rural centers. However, this figure is higher in large-sized schools (26.1%). With respect to the size of school sites, Figure 1 shows that within the same school there are sites with significantly different sizes, especially in medium-sized schools. Finally, Figure 2 shows the distance between the main and the most distant site of the school. In the case of medium-sized institutions, in 70% of the schools, the distance is less than 5 km. However, in large-sized schools, as expected, this distance is greater. In that case only 20% of the schools have a range distance of less than 5km.

Table 4 shows the descriptive statistics of the school sites included in the analysis and the definition of the variables, separated according to the number of sites of the school. As expected, there are important differences between sites belonging to single-site schools and those belonging to multi-site schools. First, sites belonging to networks have a significantly smaller size than the independent sites. Independent sites have an average of 467 students, while those belonging to medium-sized institutions (2-5 sites) have 345 students and those belonging to large institutions (6 sites or more) 78 students. This is consistent with the location of the sites, since most of the sites integrated into large institutions are located in rural areas (91.6%), where the population density is lower than in urban areas. However, a high percentage of independent sites are also located in rural areas (69.2%). In contrast to the above, school sites that belong to medium-sized institutions tend to be located more in urban areas, and only 56.3% are located in rural areas. The greater isolation of the sites of large institutions can also be observed in the distance to the mayor's office of the corresponding municipality and in the distance to the main site (headquarters) of the school<sup>13</sup>. While the sites of single-site institutions are an average of 10.5 km to the main building of the municipality, that distance is 11.4 km for medium-sized institutions and 15.8 km for the sites of large institutions. The distances are 5.7 km and 11 km respectively to the main site of the education institution<sup>14</sup>.

---

<sup>13</sup> We calculate "distance as the crow flies", i.e. the shortest route between two points, without considering the geographical features or the available routes.

<sup>14</sup> Given the existence of outliers in the distance to the main site, probably due to errors in georeferencing, the median distance is much shorter than the mean. The median distance to the municipality for independent sites is

The descriptive data also shows that sites that belong to large networks are mainly concentrated in the lower two SES quintiles (Figure 3), both in primary and lower secondary (57.7% and 75.2% respectively). On the other hand, in primary, independent sites are more concentrated in the two lower deciles (49.4%) than those belonging to medium-sized institutions (38%), but also a higher percentage is located in the upper quintile (13.9% vs. 8.7%), which indicates that there is greater heterogeneity within single-site schools. In the case of lower secondary, the independent sites are concentrated more in the upper quintiles and less in the lower ones than the sites in medium-sized institutions. In terms of ethnic composition, the data show that the independent sites have a higher percentage of students belonging to an ethnic group than the sites of medium and large institutions, both in primary and secondary, although the differences are smaller than in the case of socioeconomic composition.

Sites in large institutions have, on average, been functioning fewer years than the rest of the sites and they mainly use alternative teaching models. On average, only 17.9% of their students are educated under the traditional model<sup>15</sup>. This percentage is over 50% in single-site schools and medium-sized schools. The sites integrated in large networks are also more likely to have extended day programs (30.3%). The independent sites function mainly in the only-morning shift (61.6%), while those of medium-sized schools are concentrated in double-shift (29.5%) and only-morning shift (46%). In primary, a high percentage of the sites of medium and large schools only offer the primary level at the site, but the lower secondary level is available at another site in the same school (63.5% and 78.8% respectively). This implies that belonging to the network gives students more access to the next level. On the other hand, approximately 10% of the integrated sites do not have the lower secondary level available at the school. Among the independent sites, approximately half only offers the primary level, while the rest also offer the lower secondary level. Among the sites offering the lower secondary level, the majority have the upper secondary available in the same site (84.9% in independent sites and 81.5% in sites of medium-sized schools). The exception are the sites of large institutions, since, in this case, only 57.7% have upper secondary level in the same site and 25% of them do not have it in the same site. This level is available in other sites of the same school. Thus, belonging to the network is important to access the next level.

There are also differences across institutions in the academic performance measured by the SABER test of 5<sup>th</sup> and 9<sup>th</sup> grades. On average, independent sites have a lower percentage of students in the low-performing level (Insufficient), in both grades and subjects (Mathematics and Language), compared to the other categories of sites. At the same time, sites belonging to medium-sized schools have a lower percentage of students at the insufficient level, in both tests and grades, compared to the sites belonging to large institutions. Results also indicate that the school dropout rate in 5<sup>th</sup> grade is higher in sites belonging to schools with 6 or more sites (11.0%), followed by independent sites (9.8%) and those from

---

5.8 km, 5.7 km for sites from medium-sized schools and 8.7 km for sites from large-sized schools. On the other hand, the median distance to the main site for medium-sized schools is 1.7 km and 5.1 km for sites from large-sized schools.

<sup>15</sup> The opposite of traditional is a flexible education model, which has specific educational materials and defined training processes. These models are designed to serve diverse populations, in situations of vulnerability and who have difficulty accessing the regular model (e.g. *Escuela Nueva, Post-Primaria, Telesecundaria*). More information about these alternative models can be found in <https://www.mineducacion.gov.co/1759/w3-propertyvalue-55270.html>

medium-sized schools (8.4%). In the case of 9<sup>th</sup> grade, the dropout rate is higher in sites from large schools (10.2%), followed by sites from medium-sized schools (8.0%) and independent sites (7.5%).

The data also indicate that sites in larger networks are more likely to have younger teachers with lower monthly salaries<sup>16</sup>, and less likely to have a permanent contract than colleagues that work at independent sites. The difference between single-site and medium-sized institutions are much smaller. These differences can also be observed in access to information and communication technology infrastructure. Sites belonging to large institutions are less likely to have access to the Internet and computer rooms. Independent sites are less likely to have access to the Internet, compared to those belonging to medium-sized institutions.

## 5. Results

### 5.1. Learning outcomes and dropout rates

Tables 5-8 present the results of estimations for the percentage of students in the lower level (*insuficiente*) in SABER 5<sup>th</sup> and 9<sup>th</sup> grade in Language and Mathematics. When controls are not included at the school site or Territorial Entity level (Specification 1), the results show that the sites that belong to multi-site schools, both medium (2-5 sites) and large (6 sites or more), have a higher percentage of students in the insufficient level than independent sites (between 3 and 5 percentage points more, depending on the area and grade). This gap is even higher when considering those sites located farthest from the main site of the school (Specification 9). However, when we control for the characteristics of the sites and Territorial Entities (Specifications 2 and 3), the results are no longer significant, as well as when Territorial Entity fixed effects are included (Specification 4). According to these results, the sites that belong to larger networks have lower educational results, which is explained mainly by their location, socioeconomic composition, and other observable characteristics included in the regression. Thus, our results suggest

---

<sup>16</sup> In Colombia, there are two different pay scales for teachers in the public sector. Teachers that entered in the teacher career before 2002 are governed by Decree 2277 of 1979 and those hired after that year by Decree 1278 of 2002. The current pay scale is divided in three different grades, defined by the level of education of teachers: i) Normal-school or technical teacher, ii) University graduate in education or non-graduate professional, and iii) University graduate in education or non-graduate professional with master or doctorate degree. In each grade there are four levels (A, B, C and D) through which teachers increase as they gain experience and pass a competency assessment. The evaluation is voluntary and can be presented by teachers and directors aspiring to be promoted or relocated in the scale. There is a base monthly salary in each combination of grade and level. The old pay scale consists of 14 levels, each one having a higher monthly base salary. The education level of the teacher determines at what level she enters. For example, a teacher with a Normalist degree entered Level 4, while a teacher with a Bachelor's degree entered Level 7. Increases on the scale are determined by experience; every three years teachers go to the next level of the scale, which brings a salary increase of approximately 12 percent (Ome, 2013). If a teacher acquires additional education, (which does not necessarily lead to a formal education qualification), he can substitute this additional education for experience, implying that he will ascend faster.

that there is not a statistically significant relationship between belonging to a multi-site institution and the academic performance of the institutions<sup>17</sup>.

Regarding the fifth-grade dropout (last grade of primary education) (Table 9), the results show that, without controlling for other factors (Specification 1), the sites belonging to medium-sized institutions have a dropout rate lower than the independent sites (-1.1 pp). But at the same time, the sites that belong to large institutions have higher dropout rates (+1.4 pp) than independent sites. However, this relation is no longer significant once we control for the characteristics of the sites (Specification 2). We also find that, with respect to the independent sites that do not have lower secondary (reference category), all the other categories of sites show lower dropout rates (Specifications 5-8), which implies that having lower secondary school in the same site or having that level available at another site within the school, reduces the likelihood of dropping out for a fifth-grade student. For example, the dropout rate is 6.3 and 4.9 percentage points lower (for medium and large networks respectively) in sites in which the integration make available lower secondary (i.e. do not have lower secondary, but other sites in the same school offer this level), with respect to single-site schools that do not have lower secondary (Specification 8). The latter was precisely one of the objectives of the reorganization of the educational supply. This is relevant, because a recent paper shows that the highest dropout rate is in the transition between 5th and 6th grade (Sanchez et al, 2018).

In the ninth grade (last grade of lower secondary) the results are different (Table 10), since in this case, the sites belonging to medium and large institutions have a higher dropout rate than independent sites, especially those located at a greater distance from the main site. This result holds even after controlling for the characteristics of the sites and territorial entities they belong to. The difference with respect to 5<sup>th</sup> grade is that 86% of the independent sites that have 9<sup>th</sup> grade also have the upper secondary level at the same site, which reduces the probability to drop out (See Table 4 for descriptive statistics). This shows that the impact of the policy is greater in those schools that only have the primary level and can now access the next level in the same institution.

## **5.2. School inputs and technological infrastructure**

Tables 11, 12, 13 and 14 show evidence that, other things held constant, sites belonging to multi-site schools, especially those in the largest networks, have teachers with lower average monthly salaries (Table 11), more likely to have temporary contracts (Table 12) and younger (Table 13 and 14), than teachers that work at single-site institutions. The difference between site categories is greater when the site is farthest

---

<sup>17</sup> The results do not change if the model is estimated only with the non-main sites of the multi-site schools and when we restrict the sample just to sites located outside of the capitals of the departments (32 municipalities) and Bogotá. We also used propensity score matching to estimate the average treatment effect (ATT) of belonging to a multi-site school, using the same control variables in Tables 3-6 to estimate the propensity score and imposing a common support by dropping treatment observations whose pscore is higher than the maximum or less than the minimum pscore of the controls. We also estimated the Lee Selection Model for SABER 5<sup>th</sup> (Lee, 1983), in which selectivity is modelled as a multinomial logit (as opposed, for instance, to a univariate Probit as in the Heckman model) using the availability of lower secondary at the school site as the exclusion variable. In both cases, the results show that there are no significant differences in the SABER results between sites belonging to multi-site schools (medium or large) and single-site schools. These results are available upon request.

away from the main site (Specifications 9-11), which supports the hypothesis that there are inequities within schools with several sites, affecting those more isolated from the main site. For example, a teacher in a school site that belongs to a large institution but is more than 5 km away from the main site, earns a monthly base salary of almost 220,000 pesos ( $\approx 72$  USD) less than a teacher in a single-site school (Specification 11). On the contrary, there are no significant differences between the latter and the teachers in medium-sized schools that are within a radius of 1 km from the main site. However, when we add the ETC fixed effect to the regression, the results change, and school sites belonging to medium-sized institutions have teachers with higher average salaries, with a higher probability of being older and having a permanent contract than the rest of categories.

On the other hand, results show that the sites of large institutions (more than 6 sites) and especially those farthest away from the main site, are less likely to have access to the Internet and a computer room (Tables 15 and 16) than single sites. In this case, the results are significant in all specifications, even when ETC fixed effects are included. For example, a site that belongs to a large school but is located more than 5 km away from the main site, has a probability of having internet 11.1 percentage points less than in a single-site school (Specification 12). On the contrary, there are no significant differences between the latter and school sites located within a radius of 1 km from the main site. However, it is interesting that belonging to a medium-sized network, especially when it is close to the headquarter school, increases the likelihood of having an Internet connection. In this case it may be that belonging to the network allows access to the sites with an Internet connection.

These results are consistent with qualitative assessments indicating the existence of deficiencies in the infrastructure in school sites belonging to multi-site schools and problems to recruit quality teachers, which is exacerbated by the distance to the main site of the school, restricting the learning opportunities offered to their students (Econometría, 2013).

## **6. Discussion**

The objective of this paper is to contribute to the debate about the reorganization of the public-school supply. We analyze a reform introduced in Colombia in 2001 that merged several independent small schools into a single educational institution, with the same name, administration, educational project and school principal. To inform that debate, we estimate the differences in student achievement and measures of teacher characteristics and technological infrastructure between school sites belonging to a multi-site institution with single-site schools.

We find that there are no significant differences in SABER test scores between sites belonging to multi-site schools and single-site schools, after controlling for characteristics of the school site and the territorial entity to which the school belongs. However, we found suggestive evidence that school sites, especially the larger networks (more than 6 sites) and located far away from the main site of the school, tend to have younger teachers that earn lower salaries and are more likely to have a temporary contract. However, it is not possible to disentangle how much of this inequity is explained by teacher preferences for schools during the hiring process (e.g. because applicants with high scores in the teacher contest may

be less willing to choose vacancies in locations far from the main headquarters due to lower autonomy and isolation) and how much is explained by decisions of the school principal or education secretary about the allocation of teachers within schools (e.g. focus on the results of the main site of the school). This is a topic to be explored in future research.

We also find evidence that more isolated sites from large-sized schools have less of a probability to have access to the Internet and a computer room than single-site schools. Considering the long distances that exist between sites in large-sized schools, the lack of connectivity may mean high coordination costs, which reduce the possibility of generating cooperation and exchange of inputs and personnel within school networks. One way to address this problem is to focus public infrastructure investments from the central government and territorial entities could focus on school sites in remotes areas that belong to multi-site schools. Another option is to modify the funding formula in Colombia to consider special transfers to institutions with networks of school sites.

However, preliminary results presented in this draft must be taken with caution, because, as was shown in the descriptive statistics, there are very large differences in observed variables between school sites belonging to multi-site institutions and those functioning as a single-site school. Even after controlling for a set of characteristics of the sites, there is little common support between treated and control sites, since sites belonging to networks are much smaller, are much less likely to have the next level available (lower secondary or high-school), are more likely to have non-traditional educational models, are more likely to be located in rural areas, and are more likely to be a single-teacher school than single-site schools. This is more pronounced in larger sized school networks with more than 6 sites. This lack of common support can affect the results and bias the estimations. So, it is difficult to conclude that the statistical relationships found are causally attributable to belonging to a multi-site school. However, from the point of view of public policy, what is relevant is that these sites, especially those far from the main site, lack the basic infrastructure to work in a network and have difficulties in recruiting quality teachers. This conclusion implies that interventions should focus on these schools. Another difficulty is the lack of evidence about the implementation of the network formation process and the moment in which each institution merged, given that this process was implemented individually by each entity and for the time that has elapsed since the implementation, which makes it difficult to determine potential explanatory variables of the treatment.

Another limitation of this study is that, due to a lack of information, we do not analyze potential cooperation mechanisms between different sites of the same school that can compensate for the lack of infrastructure and quality teachers. The existence of this cooperation may explain why we do not find differences in test scores after considering observable differences between school sites. Some qualitative evidence suggest that these cooperation mechanisms exist in practice (Econometría, 2013). For example, this research suggests that school principals promote visits to support teachers from other schools or to discuss pedagogical issues several times a year, the most frequent is to advise teachers, whose frequency varies between 11 times a year in Bolívar up to 19 times in Norte de Santander. Joint meetings are also held for cultural or pedagogical activities that fluctuate between 4 per year in Cundinamarca and 8 in Bolívar. In general, there is access, from the library, the computer room and the sports facilities of the main site, to the students of other sites. This coincides with the response of the number of days that

teachers and students have used the resources of the main office, where Bolívar has 15 days a year, Cundinamarca 3, Guaviare 7 and Norte de Santander 9. At the same time there is evidence of teachers from the main site teaching in other sites and teachers working in several sites in the same school network.

## Figures and tables

Table 1. Distribution of school sites according to number of sites of the school

		schools	sites
1 site	N	3,292	3,292
	%	33.3	7.6
2-5 sites	N	3,831	12,391
	%	38.7	28.5
6 or more sites	N	2,769	27,797
	%	28.0	63.9
Total	N	9,892	43,480
	%	100	100

Table 2. Distribution of schools, by number of sites and grades offered

	1 site		2-5 sites		6 or more sites	
	N	%	N	%	N	%
Preschool (PS)	8	0.2%	0	0.0%	0	0.0%
Primary (P)	437	13.3%	9	0.2%	3	0.1%
Lower secondary (LS)	1	0.0%	0	0.0%	0	0.0%
Upper secondary (US)	3	0.1%	0	0.0%	0	0.0%
PS-P	1,297	39.4%	320	8.4%	219	7.9%
P-LS	15	0.5%	0	0.0%	0	0.0%
LS-US	23	0.7%	3	0.1%	2	0.1%
PS-P-LS	216	6.6%	311	8.1%	456	16.5%
P-LS-US	8	0.2%	5	0.1%	4	0.1%
PS-P-LS-US	1,275	38.7%	3,183	83.1%	2,085	75.3%
Only adults	9	0.3%	0	0.0%	0	0.0%
Total	3,292	100.0%	3,831	100.0%	2,769	100.0%

Table 3. Distribution of schools, by number and location of sites

	1 site		2-5 sites		6 or more sites	
	N	%	N	%	N	%
Only rural sites	2,277	69.2%	1,792	46.8%	1,971	71.2%
Only urban sites	1,015	30.8%	1,641	42.8%	75	2.7%
Urban and Rural sites	0	0.0%	398	10.4%	723	26.1%
Total	3,292	100.0%	3,831	100.0%	2,769	100.0%

Figure 1. Total enrollment range within multi-site schools

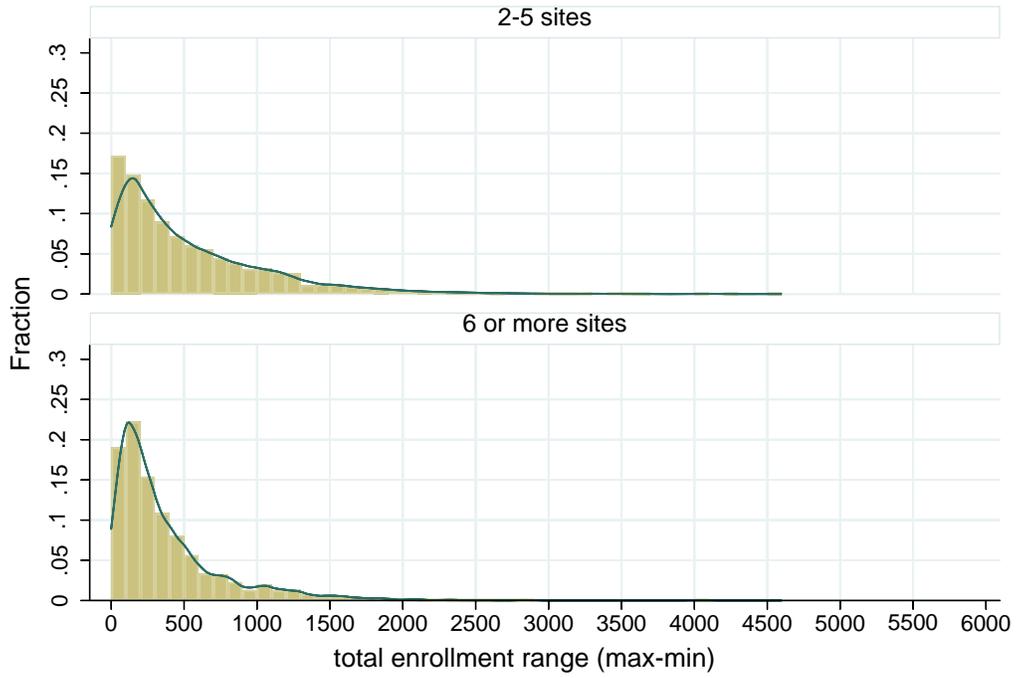


Figure 2. Distance to the main site range within multi-site schools

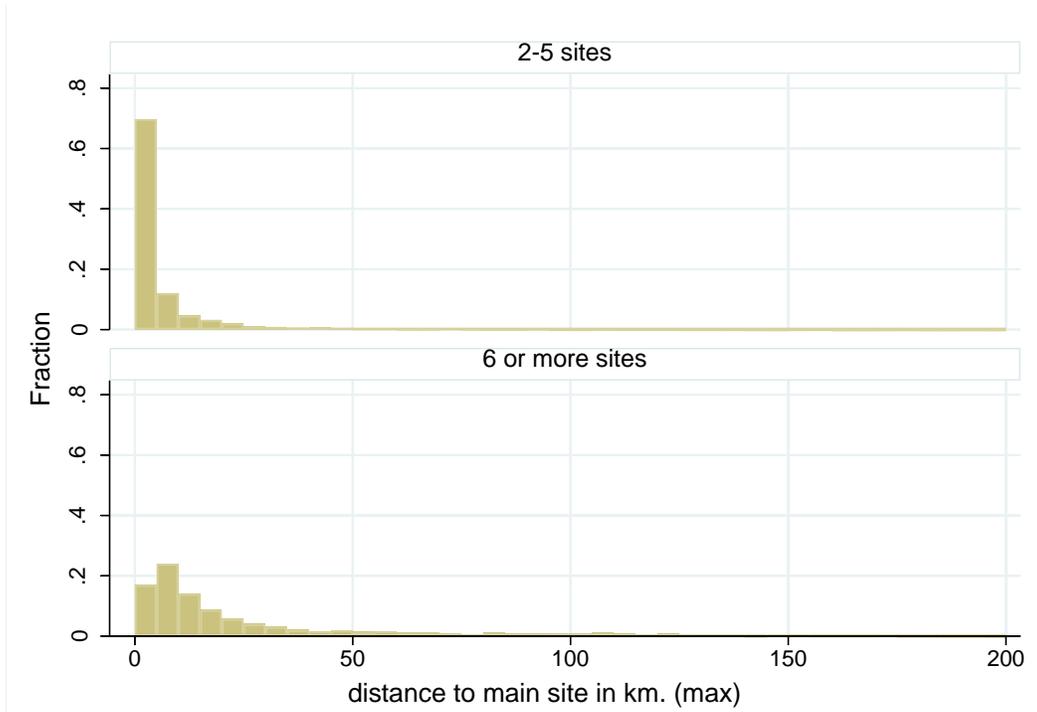


Figure 3. Distribution of school sites according to SES of student population

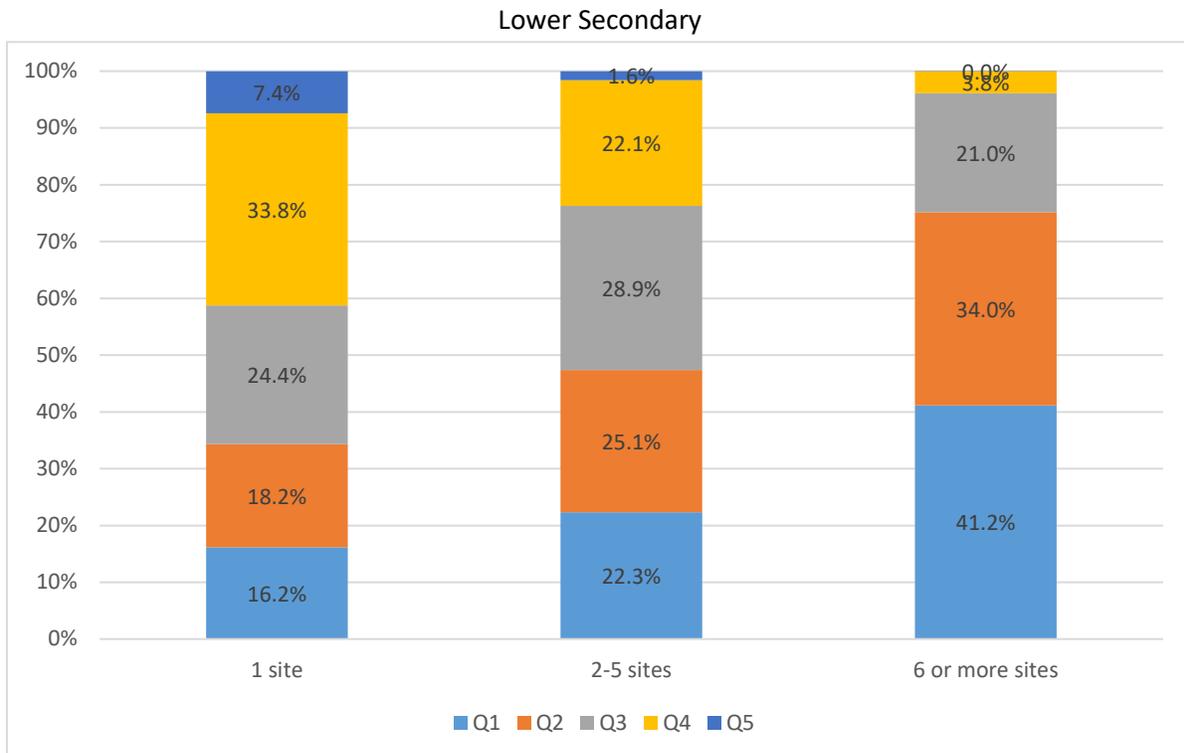
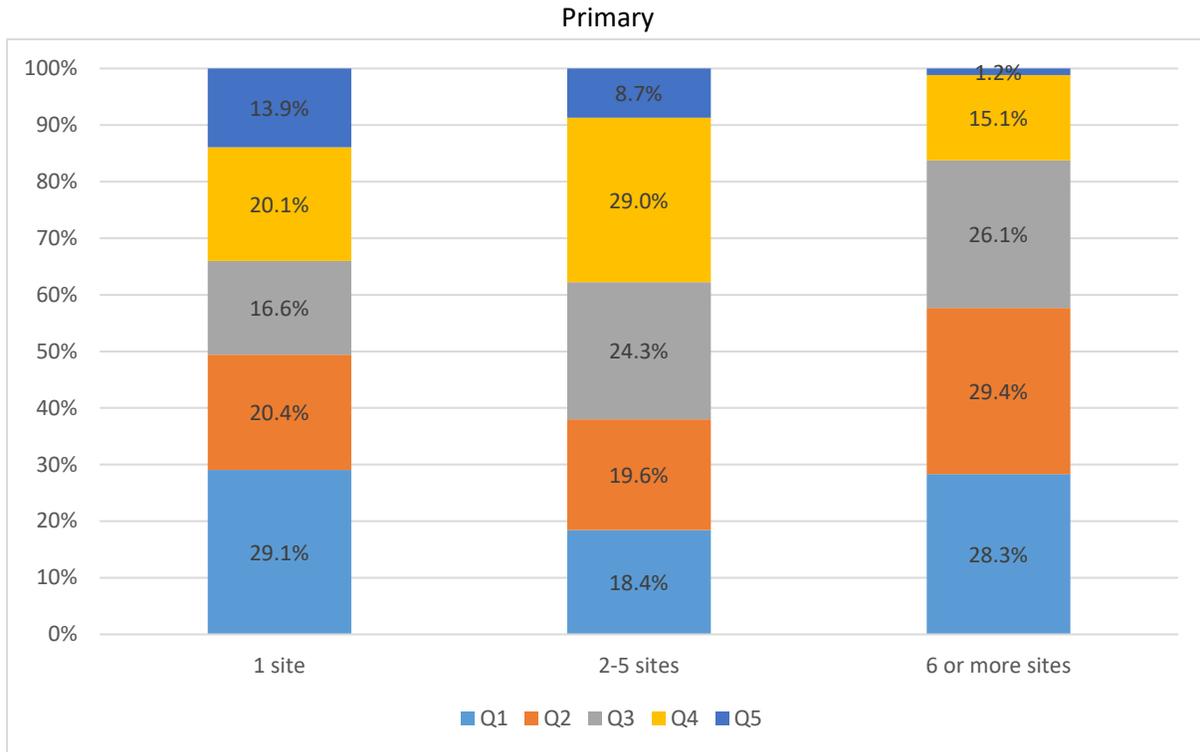


Table 4. Descriptive statistics of the database

Variable name	Description	1 site		2-5 sites		6 or more sites	
		mean	N	mean	N	mean	N
<b>Outcome variables</b>							
p_insuficientelenguaje_5_grado	percentage of students in the lower level ( <i>insuficiente</i> ) of SABER 5th grade Language test	15.7%	778	18.9%	4899	19.3%	3257
p_insuficientematematicas_5_grado	percentage of students in the lower level ( <i>insuficiente</i> ) of SABER 5th grade Mathematics test	37.3%	778	41.7%	4891	41.7%	3245
p_insuficientelenguaje_9_grado	percentage of students in the lower level ( <i>insuficiente</i> ) of SABER 9th grade Language test	16.2%	762	19.9%	2936	20.2%	1985
p_insuficientematematicas_9_grado	percentage of students in the lower level ( <i>insuficiente</i> ) of SABER 9th grade Mathematics test	21.1%	759	24.5%	2918	25.6%	1935
asignacion_basica_m_m	base salary of all teachers in the site (MM Colombian pesos 2016)	2.3	2784	2.3	11169	2.0	22950
p_profesores22_edad	percentage of teachers (20-25 years) in primary education	2.1%	3014	2.2%	10313	5.2%	25134
p_profesores32_edad	percentage of teachers (20-25 years) in lower secondary education	0.9%	1414	1.1%	3880	2.2%	3837
p_profesores26_edad	percentage of teachers (>40 years) in primary education	65.3%	3014	63.0%	10313	48.2%	25134
p_profesores36_edad	percentage of teachers (>40 years) in lower secondary education	58.9%	1414	59.7%	3880	44.6%	3837
p_profesores1_con	percentage of teachers with permanent contract in the teacher career path	81.6%	3092	88.4%	11853	76.6%	26474
tieneint_n	percentage with access to the internet	49.2%	3092	61.9%	11853	27.8%	26474
tieneaul_n	percentage with access to computer room	73.8%	3092	74.0%	11853	44.2%	26474
desercion5	dropout rate 5th grade (%)	9.8%	2033	8.4%	7559	11.0%	7909
desercion9	dropout rate 9th grade (%)	7.5%	1373	8.0%	3535	10.2%	2425
<b>School site characteristics</b>							
matr_tot	total enrollment	467	3292	345	12391	78	27797
unidocente_2	percentage single-teacher in primary	40.9%	3014	29.7%	10313	73.8%	25134
unidocente_3	percentage single-teacher in lower secondary	3.5%	1414	3.2%	3880	20.4%	3837
zona2	percentage rural	69.2%	3292	56.3%	12391	91.6%	27797
quintil5_1	percentage in SES quintil 1 5th grade	29.1%	2508	18.4%	7162	28.3%	12047
quintil5_2	percentage in SES quintil 2 5th grade	20.4%	2508	19.6%	7162	29.4%	12047
quintil5_3	percentage in SES quintil 3 5th grade	16.6%	2508	24.3%	7162	26.1%	12047
quintil5_4	percentage in SES quintil 4 5th grade	20.1%	2508	29.0%	7162	15.1%	12047
quintil5_5	percentage in SES quintil 5 5th grade	13.9%	2508	8.7%	7162	1.2%	12047
quintil9_1	percentage in SES quintil 1 9th grade	16.2%	1226	22.3%	3267	41.2%	2770
quintil9_2	percentage in SES quintil 2 9th grade	18.2%	1226	25.1%	3267	34.0%	2770
quintil9_3	percentage in SES quintil 3 9th grade	24.4%	1226	28.9%	3267	21.0%	2770
quintil9_4	percentage in SES quintil 4 9th grade	33.8%	1226	22.1%	3267	3.8%	2770
quintil9_5	percentage in SES quintil 5 9th grade	7.4%	1226	1.6%	3267	0.0%	2770
antiguedad	years of operation	30	3085	29	11824	24	26420
p_matricula_modelo1	percentage of students in a traditional model of teaching	51.3%	3248	59.6%	10951	17.9%	26779
tipo_jornada1	percentage full-time	2.4%	3292	10.4%	12391	30.3%	27797
tipo_jornada2	percentage double-shift	26.6%	3292	29.5%	12391	3.7%	27797
tipo_jornada3	percentage only morning shift	61.6%	3292	46.0%	12391	56.6%	27797
tipo_jornada4	percentage other type of school day	9.4%	3292	14.1%	12391	9.4%	27797
etnias2	percentage of students belonging to an ethnic group in primary	24.5%	3248	16.3%	10951	12.4%	26779
repitente22	percentage of students who have repeated a course in primary	2.6%	3248	3.1%	10951	2.9%	26779
cont_primaria1	percentage only primary site (it does not have lower secondary level neither at the site nor at the school)	53.4%	3248	10.1%	10951	8.3%	26779
cont_primaria2	percentage with lower secondary at the site	46.6%	3248	26.4%	10951	13.0%	26779
cont_primaria3	percentage only primary site but with lower secondary in the school	-	3248	63.5%	10951	78.8%	26779
etnias3	percentage of students belonging to an ethnic group in lower secondary	16.0%	1538	14.2%	4148	12.2%	4346
repitente23	percentage of students who have repeated a course in lower secondary	3.4%	1538	3.7%	4148	2.8%	4346
cont_secundaria1	percentage only lower secondary site (it does not have upper secondary level neither at the site nor at the school)	15.1%	1538	8.7%	4148	17.1%	4346
cont_secundaria2	percentage with upper secondary at the site	84.9%	1538	81.5%	4148	57.7%	4346
cont_secundaria3	percentage only lower secondary site but with upper secondary in the school	-	1538	9.9%	4148	25.2%	4346
distancia_sede_alcaldia	distance between the school site and the main building of the municipality (km)	10.5	3131	11.4	11651	15.8	25572
distancia_sede_principal	distance between the school site and the main site of the school (km)	-	3131	5.7	7905	11.0	22853

**Notes:**

SABER scores and dropout rates includes only schools with more than 6 students in 5th and 9th grade

Distance to the main site includes only sites different from the main site of the school

Table 5. Main regression for percentage of students in the lower level (*insuficiente*) of SABER 5th grade Language test

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2-5 sites	0.032*** (3.70)	-0.001 (-0.21)	-0.000 (-0.06)	0.004 (0.69)								
6 or more sites	0.036*** (5.48)	-0.008 (-1.02)	-0.002 (-0.21)	0.010 (1.32)								
total enrollment	0.000 (1.24)	0.000 (1.78)	0.000* (2.16)		0.000 (1.19)	0.000 (1.81)	0.000* (2.48)		0.000 (1.60)	0.000* (2.00)	0.000** (2.69)	
single-teacher	0.017 (1.19)	0.019 (1.43)	0.023 (1.67)		0.017 (1.18)	0.019 (1.41)	0.022 (1.63)		0.014 (0.99)	0.017 (1.27)	0.020 (1.43)	
rural	-0.020** (-2.98)	-0.029*** (-4.04)	-0.025*** (-3.60)		-0.020** (-2.83)	-0.038*** (-3.83)	-0.023*** (-3.30)		-0.021** (-3.03)	-0.029*** (-4.07)	-0.025*** (-3.68)	
quintile 2 SES (5th grade)	-0.053*** (-4.28)	-0.048*** (-3.93)	-0.049*** (-4.08)		-0.053*** (-4.27)	-0.048*** (-3.92)	-0.048*** (-4.06)		-0.052*** (-4.18)	-0.048*** (-3.86)	-0.047*** (-3.96)	
quintile 3 SES (5th grade)	-0.086*** (-7.09)	-0.076*** (-6.35)	-0.070*** (-5.94)		-0.086*** (-7.09)	-0.077*** (-6.36)	-0.070*** (-5.97)		-0.085*** (-7.02)	-0.076*** (-6.29)	-0.069*** (-5.85)	
quintile 4 SES (5th grade)	-0.155*** (-12.49)	-0.145*** (-11.57)	-0.110*** (-8.85)		-0.155*** (-12.47)	-0.145*** (-11.57)	-0.110*** (-8.88)		-0.155*** (-12.42)	-0.144*** (-11.51)	-0.109*** (-8.77)	
quintile 5 SES (5th grade)	-0.223*** (-17.16)	-0.212*** (-15.70)	-0.160*** (-12.03)		-0.223*** (-17.11)	-0.212*** (-15.69)	-0.163*** (-12.07)		-0.223*** (-17.11)	-0.211*** (-15.65)	-0.159*** (-11.96)	
% of students belonging to an ethnic group in primary	0.124*** (9.54)	0.112*** (8.54)	0.109*** (7.33)		0.124*** (9.52)	0.112*** (8.53)	0.109*** (7.30)		0.125*** (9.64)	0.112*** (8.61)	0.109*** (7.36)	
% of students who have repeated a course in primary	0.060 (1.38)	0.027 (0.67)	0.043 (1.16)		0.061 (1.39)	0.027 (0.68)	0.044 (1.20)		0.060 (1.39)	0.027 (0.68)	0.044 (1.18)	
years of operation	-0.003*** (-4.35)	-0.003*** (-4.63)	-0.003*** (-4.93)		-0.003*** (-4.34)	-0.003*** (-4.61)	-0.003*** (-4.91)		-0.003*** (-4.24)	-0.003*** (-4.55)	-0.003*** (-4.83)	
% of students in a traditional model of teaching (1)	0.006 (0.74)	-0.005 (-0.66)	-0.011 (-1.45)		0.006 (0.74)	-0.005 (-0.67)	-0.011 (-1.49)		0.006 (0.81)	-0.004 (-0.58)	-0.010 (-1.27)	
double-shift	0.065*** (8.02)	0.054*** (6.35)	0.030*** (3.45)		0.065*** (7.93)	0.053*** (6.26)	0.031*** (3.43)		0.067*** (8.09)	0.054*** (6.42)	0.032*** (3.59)	
only morning shift	0.034*** (4.31)	0.033*** (4.23)	0.015 (1.65)		0.034*** (4.30)	0.033*** (4.19)	0.014 (1.61)		0.034*** (4.32)	0.033*** (4.25)	0.014 (1.65)	
other type of school day	0.026** (3.21)	0.024** (2.88)	0.011 (1.22)		0.026** (3.13)	0.024** (2.82)	0.011 (1.22)		0.027*** (3.32)	0.025** (2.99)	0.012 (1.41)	
distance school site-municipality (1-5 km)	-0.017** (-3.12)	-0.022*** (-3.74)	-0.003 (-0.57)		-0.017** (-3.11)	-0.022*** (-3.72)	-0.003 (-0.54)		-0.018*** (-3.40)	-0.023*** (-3.89)	-0.005 (-0.80)	
distance school site-municipality (5-20 km)	-0.005 (-0.81)	-0.008 (-1.17)	0.008 (1.11)		-0.005 (-0.81)	-0.008 (-1.16)	0.008 (1.15)		-0.006 (-0.95)	-0.009 (-1.24)	0.007 (0.99)	
distance school site-municipality (20-100 km)	0.003 (0.40)	0.004 (0.44)	0.024** (2.68)		0.003 (0.39)	0.004 (0.44)	0.024** (2.69)		0.003 (0.34)	0.004 (0.41)	0.024** (2.63)	
distance school site-municipality (>100 km)	0.001 (0.02)	0.004 (0.12)	0.022 (0.74)		0.001 (0.03)	0.004 (0.12)	0.022 (0.75)		0.003 (0.08)	0.005 (0.16)	0.024 (0.81)	
Total per student spending in the ETC		-0.000*** (-10.09)				-0.000*** (-10.13)				-0.000*** (-10.06)		
% low-SES students in the ETC (5th grade) (2)		-0.268*** (-6.97)				-0.268*** (-6.91)				-0.264*** (-6.84)		
total public enrollment ETC		0.000 (1.06)				0.000 (1.04)				0.000 (1.07)		
Percentage of rural students in the ETC		0.163*** (6.00)				0.164*** (5.99)				0.162*** (5.95)		
<b>Heterogeneous effects by availability of the next level</b>												
1 site: with lower secondary					-0.009 (-0.22)	-0.011 (-0.29)	-0.022 (-0.57)	-0.031 (-0.77)				
2-5 sites: no changes with integration (3)					0.034 (0.84)	-0.013 (-0.33)	-0.023 (-0.59)	-0.028 (-0.69)				
2-5 sites: integration make available lower secondary					0.015 (0.39)	-0.012 (-0.29)	-0.020 (-0.53)	-0.023 (-0.56)				
6 or more sites: no changes with integration					0.038 (0.96)	-0.018 (-0.46)	-0.022 (-0.59)	-0.020 (-0.50)				
6 or more sites: integration make available lower secondary					0.020 (0.51)	-0.019 (-0.48)	-0.023 (-0.59)	-0.019 (-0.46)				
<b>Heterogeneous effects by distance to the main site</b>												
2-5 sites & <1km to principal site									0.027*** (4.68)	-0.001 (-0.24)	-0.000 (-0.06)	0.004 (0.65)
2-5 sites & 2-5 km to principal site									0.048*** (5.71)	0.009 (0.92)	0.005 (0.58)	0.015 (1.68)
2-5 sites & >5km to principal site									0.063*** (4.48)	-0.004 (-0.32)	-0.003 (-0.19)	0.010 (0.79)
6 or more sites & <1km to principal site									0.021** (3.13)	-0.011 (-1.35)	-0.004 (-0.54)	0.008 (0.98)
6 or more sites & 2-5 km to principal site									0.051*** (4.78)	-0.000 (-0.03)	0.004 (0.32)	0.019 (1.73)
6 or more sites & >5km to principal site									0.063*** (5.73)	0.006 (0.48)	0.010 (0.78)	0.028* (2.32)
constant	0.155*** (31.94)	0.263*** (16.08)	0.405*** (17.57)	0.266*** (15.21)	0.164*** (4.15)	0.274*** (6.39)	0.535*** (10.91)	0.295*** (6.68)	0.155*** (31.93)	0.260*** (15.75)	0.400*** (17.22)	0.261*** (14.84)
Fixed effects ETC level	No	No	No	Yes	No	No	No	Yes	No	No	No	Yes
N	8502	6327	6327	6327	8495	6327	6327	6327	8502	6327	6327	6327
r2	0.005	0.175	0.194	0.272	0.006	0.175	0.194	0.272	0.009	0.175	0.195	0.273
aic	-5501.813	-5725.594	-5871.239	-6334.189	-5506.437	-5719.725	-5865.579	-6329.404	-5541.780	-5723.447	-5866.590	-6334.663
bic	-5480.669	-5583.790	-5702.425	-5557.642	-5464.153	-5557.664	-5676.507	-5532.599	-5482.443	-5554.633	-5670.765	-5531.106

t statistics in parentheses  
\*p<0.05; \*\* p<0.01; \*\*\* p<0.001  
Notes:  
ETC: Certified Territorial Entity  
(1) The opposite of the traditional model is a flexible education model, which has specific educational materials and defined training processes. These models are designed to serve diverse populations, in situations of vulnerability and who have difficulty accessing the regular model (e.g. Escuela Nueva, Pasa Primavera, Telesecundaria).  
(2) low-SES student: student whose mother didn't complete secondary education (5th grade)  
(3) It includes sites with lower secondary and those not having lower secondary in the school  
The categories omitted are: 1 site; quintile 1 SES (5th grade); full-time school day; distance school site-municipality (< 1 km); 1 site: no lower secondary

Table 6. Main regression for percentage of students in the lower level (*insuficiente*) of SABER 5th grade Mathematic test

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2-5 sites	0.044*** (5.20)	0.003 (0.30)	0.004 (0.42)	0.010 (1.14)								
6 or more sites	0.043*** (4.41)	-0.014 (-1.25)	-0.005 (-0.45)	0.016 (1.31)								
total enrollment		0.000 (1.30)	0.000 (0.96)	0.000* (2.02)		0.000 (1.11)	0.000 (0.87)	0.000* (2.08)		0.000 (1.66)	0.000 (1.17)	0.000* (2.46)
single-teacher		0.016 (0.71)	0.019 (0.87)	0.022 (1.03)		0.016 (0.73)	0.019 (0.88)	0.021 (1.00)		0.013 (0.59)	0.017 (0.80)	0.018 (0.87)
rural		-0.028** (-2.81)	-0.038*** (-3.65)	-0.039*** (-3.82)		-0.029** (-2.72)	-0.038*** (-3.54)	-0.038*** (-3.60)		-0.028** (-2.78)	-0.037*** (-3.60)	-0.039*** (-3.79)
quintile 2 SES (5th grade)		-0.029 (-1.84)	-0.022 (-1.45)	-0.021 (-1.34)		-0.029 (-1.85)	-0.022 (-1.45)	-0.020 (-1.33)		-0.027 (-1.75)	-0.022 (-1.39)	-0.019 (-1.24)
quintile 3 SES (5th grade)		-0.084*** (-5.44)	-0.071*** (-4.65)	-0.057*** (-3.67)		-0.084*** (-5.43)	-0.071*** (-4.65)	-0.057*** (-3.69)		-0.083*** (-5.36)	-0.070*** (-4.59)	-0.055*** (-3.59)
quintile 4 SES (5th grade)		-0.174*** (-10.68)	-0.161*** (-9.76)	-0.113*** (-6.70)		-0.173*** (-10.61)	-0.160*** (-9.74)	-0.114*** (-6.72)		-0.172*** (-10.60)	-0.159*** (-9.70)	-0.112*** (-6.62)
quintile 5 SES (5th grade)		-0.278*** (-15.98)	-0.272*** (-15.02)	-0.213*** (-11.40)		-0.278*** (-15.88)	-0.272*** (-14.99)	-0.213*** (-11.41)		-0.277*** (-15.94)	-0.271*** (-14.99)	-0.212*** (-11.34)
% of students belonging to an ethnic group in primary		0.182*** (10.40)	0.170*** (9.56)	0.155*** (7.31)		0.182*** (10.38)	0.171*** (9.55)	0.155*** (7.28)		0.183*** (10.49)	0.171*** (9.65)	0.156*** (7.36)
% of students who have repeated a course in primary		0.113 (1.72)	0.061 (1.00)	0.083 (1.34)		0.113 (1.72)	0.061 (1.00)	0.084 (1.35)		0.113 (1.74)	0.063 (1.03)	0.085 (1.38)
years of operation		-0.000** (-2.92)	-0.000** (-3.28)	-0.001*** (-4.14)		-0.000** (-2.93)	-0.000** (-3.29)	-0.001*** (-4.13)		-0.000** (-2.88)	-0.000** (-3.27)	-0.001*** (-4.09)
% of students in a traditional model of teaching (1)		0.005 (0.43)	-0.010 (-0.87)	-0.017 (-1.48)		0.005 (0.46)	-0.010 (-0.85)	-0.017 (-1.49)		0.005 (0.42)	-0.010 (-0.87)	-0.016 (-1.43)
double-shift		0.094*** (7.45)	0.083*** (6.49)	0.049*** (3.69)		0.094*** (7.39)	0.083*** (6.42)	0.050*** (3.68)		0.095*** (7.49)	0.084*** (6.53)	0.051*** (3.78)
only morning shift		0.036** (2.95)	0.043*** (3.64)	0.020 (1.50)		0.036** (2.95)	0.043*** (3.63)	0.019 (1.48)		0.036** (2.96)	0.044*** (3.66)	0.020 (1.50)
other type of school day		0.031* (2.44)	0.036** (2.88)	0.019 (1.49)		0.030* (2.37)	0.036** (2.80)	0.020 (1.48)		0.032* (2.46)	0.037** (2.88)	0.020 (1.54)
distance school site-municipality (1-5 km)		-0.017* (-2.10)	-0.026** (-2.88)	0.000 (0.04)		-0.017* (-2.09)	-0.026** (-2.87)	0.000 (0.06)		-0.020* (-2.38)	-0.027** (-3.03)	-0.002 (-0.20)
distance school site-municipality (5-20 km)		0.004 (0.38)	-0.009 (-0.82)	0.018 (1.70)		0.004 (0.38)	-0.009 (-0.81)	0.018 (1.71)		0.003 (0.27)	-0.009 (-0.85)	0.017 (1.58)
distance school site-municipality (20-100 km)		0.010 (0.81)	0.001 (0.06)	0.039** (2.83)		0.010 (0.81)	0.001 (0.06)	0.039** (2.83)		0.011 (0.85)	0.001 (0.09)	0.039** (2.82)
distance school site-municipality (>100 km)		-0.029 (-0.70)	-0.030 (-0.71)	0.018 (0.43)		-0.029 (-0.69)	-0.030 (-0.70)	0.018 (0.44)		-0.027 (-0.64)	-0.028 (-0.67)	0.020 (0.48)
Total per student spending in the ETC		-0.000*** (-9.51)				-0.000*** (-9.46)				-0.000*** (-9.47)		
% low-SES students in the ETC (5th grade) (2)		-0.380*** (-6.59)				-0.381*** (-6.59)				-0.373*** (-6.46)		
total public enrollment ETC		0.000*** (5.45)				0.000*** (5.41)				0.000*** (5.46)		
Percentage of rural students in the ETC		0.222*** (5.52)				0.222*** (5.53)				0.218*** (5.43)		
<b>Heterogeneous effects by availability of the next level</b>												
1 site: with lower secondary					0.000 (0.00)	-0.004 (-0.07)	-0.012 (-0.23)	-0.007 (-0.14)				
2-5 sites: no changes with integration (3)					0.058 (1.02)	-0.002 (-0.03)	-0.009 (-0.17)	0.002 (0.03)				
2-5 sites: integration make available lower secondary					0.032 (0.57)	-0.001 (-0.01)	-0.007 (-0.14)	0.007 (0.13)				
6 or more sites: no changes with integration					0.056 (0.98)	-0.016 (-0.27)	-0.015 (-0.29)	0.008 (0.17)				
6 or more sites: integration make available lower secondary					0.033 (0.58)	-0.021 (-0.36)	-0.019 (-0.36)	0.010 (0.20)				
<b>Heterogeneous effects by distance to the main site</b>												
2-5 sites & <3km to principal site									0.035*** (4.16)	0.002 (0.17)	0.003 (0.31)	0.009 (1.03)
2-5 sites & 2-5 km to principal site									0.073*** (5.77)	0.025 (1.80)	0.020 (1.48)	0.033* (2.43)
2-5 sites & >5km to principal site									0.063*** (3.74)	-0.020 (-0.96)	-0.017 (-0.82)	-0.004 (-0.21)
6 or more sites & <1km to principal site									0.025* (2.51)	-0.016 (-1.31)	-0.006 (-0.46)	0.015 (1.23)
6 or more sites & 2-5 km to principal site									0.065*** (4.35)	-0.009 (-0.52)	-0.005 (-0.32)	0.020 (1.20)
6 or more sites & >5km to principal site									0.068*** (4.39)	-0.005 (-0.27)	0.001 (0.06)	0.030 (1.62)
constant	0.372*** (51.32)	0.475*** (20.19)	0.795*** (19.62)	0.510*** (20.38)	0.372*** (6.60)	0.479*** (7.75)	0.807*** (12.39)	0.515*** (9.17)	0.372*** (51.31)	0.472*** (19.88)	0.789*** (19.36)	0.505*** (20.03)
Fixed effects ETC level	No	No	No	Yes	No	No	No	Yes	No	No	Yes	
N	8477	6308	6308	6308	8470	6308	6308	6308	8477	6308	6308	6308
r2	0.002	0.150	0.172	0.237	0.005	0.151	0.172	0.237	0.007	0.152	0.172	0.238
aic	580.655	-840.258	-992.349	-1332.785	571.173	-834.555	-986.551	-1327.120	550.655	-840.653	-989.650	-1333.000
bic	601.790	-698.517	-823.610	-556.584	613.439	-672.566	-797.563	-530.670	599.971	-671.913	-793.912	-529.801

T-statistics in parentheses

\*p<0.05; \*\* p<0.01; \*\*\* p<0.001

Notes:

ETC: certified Territorial Entity

(1) The opposite of the traditional model is a flexible education model, which has specific educational materials and defined training processes. These models are designed to serve diverse populations, in situations of vulnerability and who have difficulty accessing the regular model (e.g. Escuela Nueva, Post-Primaria, Telesecundaria).

(2) % low-SES students in the ETC (5th grade)

(3) low-SES student: student whose mother didn't complete secondary education (5th grade)

(4) It includes sites with lower secondary and those not having lower secondary in the school

The categories omitted are: 1 site; quintile 1 SES (5th grade); full-time school day; distance school site-municipality (< 1 km); 1 site; no lower secondary

Table 7. Main regression for percentage of students in the lower level (*insuficiente*) of SABER 9th grade Language test

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2-5 sites	0.037*** (5.64)	0.003 (0.43)	0.004 (0.60)	0.005 (0.80)								
6 or more sites	0.046*** (6.07)	-0.017** (-2.11)	-0.010 (-1.24)	-0.003 (-0.41)								
total enrollment	0.000 (1.69)	0.000 (1.24)	0.000 (0.92)		0.000* (1.99)	0.000 (1.53)	0.000 (1.11)		0.000 (1.90)	0.000 (1.39)	0.000 (1.13)	
single-teacher	0.059 (1.10)	0.053 (1.00)	0.041 (0.79)		0.057 (1.05)	0.052 (0.97)	0.042 (0.82)		0.036 (0.70)	0.034 (0.65)	0.026 (0.51)	
rural	0.004 (0.52)	-0.006 (-0.80)	-0.002 (-0.24)		0.004 (0.58)	-0.006 (-0.78)	-0.001 (-0.19)		0.004 (0.49)	-0.006 (-0.82)	-0.001 (-0.19)	
quintile 2 SES (9th grade)	-0.060*** (-6.64)	-0.054*** (-6.01)	-0.042*** (-4.75)		-0.060*** (-6.60)	-0.054*** (-5.97)	-0.042*** (-4.74)		-0.059*** (-6.49)	-0.053*** (-5.88)	-0.041*** (-4.59)	
quintile 3 SES (9th grade)	-0.111*** (-12.06)	-0.109*** (-11.59)	-0.074*** (-7.53)		-0.111*** (-12.05)	-0.109*** (-11.57)	-0.074*** (-7.52)		-0.110*** (-11.97)	-0.108*** (-11.49)	-0.073*** (-7.37)	
quintile 4 SES (9th grade)	-0.187*** (-18.96)	-0.186*** (-17.32)	-0.128*** (-11.60)		-0.187*** (-18.96)	-0.185*** (-17.29)	-0.128*** (-11.54)		-0.186*** (-18.92)	-0.185*** (-17.26)	-0.127*** (-11.46)	
quintile 5 SES (9th grade)	-0.246*** (-21.42)	-0.243*** (-19.34)	-0.179*** (-14.11)		-0.245*** (-21.34)	-0.242*** (-19.25)	-0.178*** (-14.02)		-0.245*** (-21.37)	-0.242*** (-19.28)	-0.177*** (-13.97)	
% of students belonging to an ethnic group in lower secondary	0.189*** (13.50)	0.176*** (12.41)	0.196*** (11.30)		0.189*** (13.52)	0.176*** (12.42)	0.196*** (11.28)		0.191*** (13.68)	0.178*** (12.57)	0.198*** (11.38)	
% of students who have repeated a course in lower secondary	-0.018 (-0.44)	-0.028 (-0.69)	0.019 (0.49)		-0.022 (-0.54)	-0.031 (-0.75)	0.015 (0.40)		-0.019 (-0.46)	-0.028 (-0.69)	0.019 (0.49)	
years of operation	-0.000*** (-4.24)	-0.000*** (-4.05)	-0.000*** (-3.45)		-0.000*** (-4.21)	-0.000*** (-4.07)	-0.000*** (-3.45)		-0.000*** (-4.05)	-0.000*** (-3.91)	-0.000*** (-3.35)	
% of students in a traditional model of teaching (1)	-0.012 (-1.19)	-0.022* (-2.19)	-0.027** (-2.63)		-0.011 (-1.09)	-0.021* (-2.11)	-0.027** (-2.64)		-0.008 (-0.80)	-0.018 (-1.81)	-0.024* (-2.34)	
double-shift	0.087*** (8.15)	0.071*** (6.57)	0.037*** (3.53)		0.087*** (8.15)	0.070*** (6.57)	0.037*** (3.52)		0.089*** (8.26)	0.072*** (6.71)	0.038*** (3.63)	
only morning shift	0.040*** (3.57)	0.042*** (3.74)	0.020 (1.74)		0.041*** (3.61)	0.042*** (3.77)	0.020 (1.73)		0.042*** (3.66)	0.043*** (3.83)	0.021 (1.79)	
other type of school day	0.035*** (3.47)	0.033*** (3.24)	0.010 (1.04)		0.035*** (3.56)	0.033*** (3.28)	0.010 (1.04)		0.037*** (3.69)	0.035*** (3.44)	0.012 (1.20)	
distance school site-municipality (1-5 km)	-0.009 (-1.52)	-0.015* (-2.35)	0.003 (0.43)		-0.010 (-1.64)	-0.015* (-2.39)	0.002 (0.37)		-0.009 (-1.58)	-0.015* (-2.34)	0.002 (0.41)	
distance school site-municipality (5-20 km)	-0.003 (-0.43)	-0.008 (-1.05)	0.001 (0.18)		-0.003 (-0.51)	-0.008 (-1.08)	0.001 (0.13)		-0.004 (-0.58)	-0.009 (-1.13)	0.001 (0.08)	
distance school site-municipality (20-100 km)	0.019* (2.07)	0.015 (1.55)	0.028** (2.71)		0.018* (2.01)	0.015 (1.51)	0.028** (2.68)		0.018* (2.03)	0.015 (1.53)	0.027** (2.68)	
distance school site-municipality (>100 km)	0.063 (1.95)	0.065* (2.00)	0.061* (2.07)		0.063 (1.96)	0.065* (2.00)	0.061* (2.06)		0.063 (1.96)	0.065* (2.01)	0.061* (2.09)	
Total per student spending in the ETC		-0.000*** (-10.06)				-0.000*** (-10.13)				-0.000*** (-9.99)		
% low-SES students in the ETC (5th grade) (2)		-0.288*** (-7.21)				-0.287*** (-7.21)				-0.285*** (-7.16)		
total public enrollment ETC		0.000** (2.72)				0.000** (2.68)				0.000** (2.70)		
Percentage of rural students in the ETC		0.167*** (6.28)				0.168*** (6.30)				0.167*** (6.28)		
<b>Heterogeneous effects by availability of the next level</b>												
1 site: with upper secondary					-0.106 (-1.94)	-0.047 (-0.93)	-0.063 (-1.24)	-0.028 (-0.60)				
2-5 sites: no changes with integration (3)					-0.066 (-1.22)	-0.044 (-0.87)	-0.058 (-1.15)	-0.023 (-0.50)				
2-5 sites: integration make available upper secondary					-0.032 (-0.56)	-0.006 (-0.12)	-0.032 (-0.59)	0.003 (0.06)				
6 or more sites: no changes with integration					-0.060 (-1.10)	-0.063 (-1.24)	-0.071 (-1.40)	-0.030 (-0.64)				
6 or more sites: integration make available upper secondary					-0.018 (-0.30)	-0.054 (-0.94)	-0.057 (-1.17)	-0.038 (-0.69)				
<b>Heterogeneous effects by distance to the main site</b>												
2-5 sites & < 1km to principal site									0.035*** (5.36)	0.002 (0.33)	0.003 (0.54)	0.004 (0.72)
2-5 sites & 2-5 km to principal site									0.061** (3.03)	0.019 (0.80)	0.010 (0.40)	0.024 (1.07)
2-5 sites & >5km to principal site									0.081** (2.94)	0.049 (1.50)	0.042 (1.32)	0.034 (1.09)
6 or more sites & <1km to principal site									0.035*** (4.78)	-0.019* (-2.31)	-0.012 (-1.45)	-0.004 (-0.48)
6 or more sites & 2-5 km to principal site									0.055* (2.32)	-0.014 (-0.50)	-0.007 (-0.25)	-0.014 (-0.50)
6 or more sites & >5km to principal site									0.123*** (5.64)	0.038 (1.29)	0.039 (1.32)	0.039 (1.37)
constant	0.160*** (28.38)	0.230*** (33.59)	0.483*** (16.07)	0.245*** (4.85)	0.263*** (5.21)	0.274*** (9.25)	0.542*** (5.48)	0.272*** (28.17)	0.160*** (28.17)	0.223*** (12.87)	0.473*** (15.66)	0.238*** (12.62)
Fixed effects ETC level	No	No	No	Yes	No	No	Yes	No	No	No	Yes	Yes
N	5457	4589	4589	4589	5447	4589	4589	4589	5457	4589	4589	4589
r2	0.006	0.260	0.281	0.383	0.010	0.261	0.282	0.383	0.015	0.263	0.283	0.384
aic	-3010.729	-4267.775	-4385.918	-4906.123	-3014.880	-4261.986	-4384.412	-4903.010	-3050.724	-4269.547	-4389.034	-4908.462
bic	-2990.915	-4127.715	-4225.133	-4166.510	-2975.263	-4107.632	-4204.332	-4144.103	-3004.492	-4108.762	-4202.523	-4143.123

\*\*\* Statistics in parentheses

\*p<0.05; \*\* p<0.01; \*\*\* p<0.001

Notes:

ETC: Certified Territorial Entity

(1) The opposite of the traditional model is a flexible education model, which has specific educational materials and defined training processes. These models are designed to serve diverse populations, in situations of vulnerability and who have difficulty accessing the regular model (e.g. Escuela Nueva, Post-Primaria, Telesecundaria).

(2) low-SES student: student whose mother didn't complete secondary education (5th grade)

(3) It includes sites with upper secondary and those not having upper secondary in the school

The categories omitted are: 1 site; quintile 1 SES (9th grade); full-time school day; distance school site-municipality (< 1 km); 1 site: no upper secondary

Table 8. Main regression for percentage of students in the lower level (*insuficiente*) of SABER 9th grade Mathematic test

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2-5 sites	0.096*** (5.45)	-0.001 (-0.15)	0.001 (0.10)	0.002 (0.36)								
6 or more sites	0.045*** (6.09)	-0.013 (-1.58)	-0.004 (-0.51)	0.005 (0.56)								
total enrollment		-0.000 (-0.85)	-0.000 (-1.82)	-0.000 (-1.37)		-0.000 (-0.73)	-0.000 (-1.72)	-0.000 (-1.37)		-0.000 (-0.58)	-0.000 (-1.60)	-0.000 (-1.08)
single-teacher		-0.009 (-0.20)	-0.014 (-0.31)	-0.002 (-0.04)		-0.016 (-0.36)	-0.019 (-0.46)	-0.007 (-0.14)		-0.026 (-0.59)	-0.025 (-0.59)	-0.016 (-0.32)
rural		-0.006 (-0.79)	-0.015* (-1.98)	-0.015* (-2.16)		-0.005 (-0.66)	-0.014 (-1.90)	-0.015* (-2.06)		-0.006 (-0.87)	-0.015* (-2.06)	-0.015* (-2.16)
quintile 2 SES (9th grade)		-0.047*** (-5.40)	-0.041*** (-4.81)	-0.035*** (-4.03)		-0.047*** (-5.36)	-0.041*** (-4.76)	-0.035*** (-3.98)		-0.047*** (-5.42)	-0.041*** (-4.83)	-0.035*** (-4.02)
quintile 3 SES (9th grade)		-0.088*** (-9.54)	-0.086*** (-9.35)	-0.063*** (-6.43)		-0.088*** (-9.53)	-0.086*** (-9.31)	-0.063*** (-6.38)		-0.089*** (-9.64)	-0.087*** (-9.40)	-0.063*** (-6.43)
quintile 4 SES (9th grade)		-0.165*** (-16.72)	-0.169*** (-16.08)	-0.133*** (-12.04)		-0.165*** (-16.72)	-0.169*** (-16.04)	-0.132*** (-11.99)		-0.166*** (-16.85)	-0.169*** (-16.11)	-0.132*** (-12.03)
quintile 5 SES (9th grade)		-0.245*** (-19.98)	-0.248*** (-18.94)	-0.210*** (-15.86)		-0.246*** (-20.02)	-0.248*** (-18.96)	-0.211*** (-15.88)		-0.245*** (-20.06)	-0.248*** (-18.97)	-0.209*** (-15.84)
% of students belonging to an ethnic group in lower secondary		0.204*** (14.83)	0.188*** (13.60)	0.175*** (9.98)		0.204*** (14.87)	0.189*** (13.63)	0.175*** (10.00)		0.205*** (14.94)	0.190*** (13.69)	0.175*** (10.02)
% of students who have repeated a course in lower secondary		-0.055 (-1.45)	-0.073 (-1.93)	-0.021 (-0.57)		-0.057 (-1.51)	-0.073* (-1.97)	-0.022 (-0.59)		-0.057 (-1.49)	-0.074* (-1.97)	-0.021 (-0.59)
years of operation		-0.000* (-2.17)	-0.000 (-1.88)	-0.000* (-2.00)		-0.000* (-2.04)	-0.000 (-1.79)	-0.000 (-1.89)		-0.000 (-1.96)	-0.000 (-1.72)	-0.000 (-1.86)
% of students in a traditional model of teaching (1)		-0.012 (-1.26)	-0.025** (-2.74)	-0.030** (-3.09)		-0.010 (-1.11)	-0.024** (-2.60)	-0.029** (-2.98)		-0.008 (-0.90)	-0.022* (-2.40)	-0.028** (-2.82)
double-shift		0.072*** (6.53)	0.052*** (4.79)	0.028* (2.48)		0.072*** (6.59)	0.053*** (4.88)	0.029* (2.56)		0.073*** (6.69)	0.054*** (4.94)	0.029** (2.59)
only morning shift		0.011 (1.02)	0.015 (1.41)	0.001 (0.12)		0.012 (1.06)	0.015 (1.45)	0.002 (0.13)		0.012 (1.10)	0.015 (1.47)	0.002 (0.16)
other type of school day		0.022* (2.18)	0.021* (2.14)	0.010 (0.98)		0.023* (2.36)	0.022* (2.30)	0.011 (1.11)		0.024* (2.47)	0.023* (2.38)	0.012 (1.17)
distance school site-municipality (1-5 km)		0.006 (0.91)	-0.001 (-0.12)	0.014* (2.18)		0.005 (0.78)	-0.001 (-0.16)	0.013* (2.13)		0.005 (0.82)	-0.001 (-0.16)	0.013* (2.11)
distance school site-municipality (5-20 km)		0.012 (1.82)	0.002 (0.25)	0.011 (1.54)		0.012 (1.78)	0.002 (0.25)	0.011 (1.55)		0.011 (1.68)	0.001 (0.18)	0.011 (1.44)
distance school site-municipality (20-100 km)		0.031*** (3.46)	0.021* (2.12)	0.040*** (3.92)		0.032*** (3.49)	0.021* (2.16)	0.040*** (3.99)		0.031*** (3.41)	0.021* (2.12)	0.039*** (3.90)
distance school site-municipality (>100 km)		0.050 (1.71)	0.050 (1.69)	0.058* (1.99)		0.051 (1.72)	0.050 (1.71)	0.058* (2.01)		0.049 (1.65)	0.049 (1.66)	0.057* (1.97)
Total per student spending in the ETC			-0.000*** (-12.37)				-0.000*** (-12.32)				-0.000*** (-12.31)	
% low-SES students in the ETC (5th grade) (2)			-0.332*** (-8.00)				-0.329*** (-7.94)				-0.329*** (-7.94)	
total public enrollment ETC			0.000*** (6.31)				0.000*** (6.36)				0.000*** (6.32)	
Percentage of rural students in the ETC			0.185*** (6.93)				0.185*** (6.91)				0.185*** (6.90)	
<b>Heterogeneous effects by availability of the next level</b>												
1 site: with upper secondary					-0.031 (-0.75)	0.052 (1.09)	0.036 (0.76)	0.069 (1.34)				
2-5 sites: no changes with integration (3)					0.005 (0.11)	0.049 (1.03)	0.035 (0.74)	0.068 (1.33)				
2-5 sites: integration make available upper secondary					0.062 (1.34)	0.085 (1.57)	0.059 (1.12)	0.096 (1.71)				
6 or more sites: no changes with integration					0.013 (0.31)	0.036 (0.75)	0.029 (0.61)	0.070 (1.36)				
6 or more sites: integration make available upper secondary					0.055 (1.39)	0.079 (1.40)	0.057 (1.21)	0.101 (1.71)				
<b>Heterogeneous effects by distance to the main site</b>												
2-5 sites < 1km to principal site									0.034*** (5.03)	-0.002 (-0.31)	-0.000 (-0.03)	0.001 (0.22)
2-5 sites & 2-5 km to principal site									0.079*** (3.97)	0.022 (1.10)	0.014 (0.73)	0.034* (1.96)
2-5 sites & >5km to principal site									0.110*** (3.30)	0.073 (1.89)	0.065 (1.76)	0.052 (1.34)
6 or more sites & <1km to principal site									0.035*** (4.75)	-0.014 (-1.74)	-0.006 (-0.66)	0.004 (0.52)
6 or more sites & 2-5 km to principal site									0.090*** (3.58)	0.008 (0.24)	0.021 (0.62)	0.010 (0.31)
6 or more sites & >5km to principal site									0.127*** (6.77)	0.035 (1.28)	0.031 (1.16)	0.042 (1.57)
constant	0.208*** (36.22)	0.275*** (16.86)	0.580*** (18.90)	0.335*** (17.51)	0.238*** (5.88)	0.221*** (4.44)	0.539*** (9.72)	0.265*** (4.96)	0.208*** (36.21)	0.269*** (16.70)	0.571*** (18.79)	0.329*** (17.56)
Fixed effects ETC level	No	No	No	Yes	No	No	No	Yes	No	No	No	Yes
N	5498	4674	4674	4674	5490	4674	4674	4674	5498	4674	4674	4674
r2	0.006	0.228	0.261	0.343	0.009	0.229	0.262	0.344	0.017	0.231	0.262	0.345
aic	-3284.598	-4186.393	-4381.452	-4755.132	-3286.912	-4189.674	-4381.318	-4757.210	-3336.092	-4194.409	-4384.643	-4757.810
bic	-3264.761	-4050.947	-4220.208	-4013.409	-3247.248	-4034.880	-4200.725	-3996.137	-3289.807	-4033.165	-4197.600	-3990.287

\*\*\* Statistics in parentheses

\*p<0.05; \*\* p<0.01; \*\*\* p<0.001

Notes:

ETC: Certified Territorial Entity

(1) The opposite of the traditional model is a flexible education model, which has specific educational materials and defined training processes. These models are designed to serve diverse populations, in situations of vulnerability and who have difficulty accessing the regular model (e.g. Escuela Nueva, Post-Primaria, Telesecundaria).

(2) low-SES student: student whose mother didn't complete secondary education (5th grade)

(3) It includes sites with upper secondary and those not having upper secondary in the school

The categories omitted are: 1 site; quintile 1 SES (9th grade); full-time school day; distance school site-municipality (< 1 km); 1 site: no upper secondary

Table 9. Main regression for dropout rate in 5th grade

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
2-5 sites	-0.011** (-2.90)	-0.003 (-0.95)	-0.007* (-2.19)	0.005 (1.55)									
6 or more sites	0.014** (3.27)	-0.004 (-0.90)	-0.007 (-1.62)	0.013** (2.98)									
total enrollment		-0.000*** (-8.62)	-0.000*** (-8.23)	-0.000*** (-9.44)		-0.000** (-3.09)	-0.000* (-2.51)	-0.000*** (-4.26)		-0.000*** (-7.81)	-0.000*** (-7.44)	-0.000*** (-8.31)	
single-teacher		0.013** (2.98)	0.014*** (3.33)	0.016*** (3.86)		0.007 (1.48)	0.008 (1.78)	0.011* (2.51)		0.010* (2.24)	0.011** (2.61)	0.012** (2.91)	
rural		-0.012** (-3.28)	-0.015*** (-3.92)	-0.008* (-2.02)		-0.009* (-2.31)	-0.012** (-3.06)	-0.004 (-1.02)		-0.013*** (-3.40)	-0.016*** (-4.04)	-0.008* (-2.11)	
quintile 2 SES (5th grade)		-0.015** (-3.08)	-0.014** (-2.89)	-0.011* (-2.40)		-0.013** (-2.87)	-0.012** (-2.60)	-0.010* (-2.18)		-0.014** (-2.92)	-0.013** (-2.75)	-0.010* (-2.17)	
quintile 3 SES (5th grade)		-0.033*** (-7.02)	-0.030*** (-6.47)	-0.027*** (-5.79)		-0.032*** (-6.81)	-0.029*** (-6.12)	-0.026*** (-5.57)		-0.032*** (-6.91)	-0.030*** (-6.36)	-0.026*** (-5.65)	
quintile 4 SES (5th grade)		-0.049*** (-9.77)	-0.044*** (-8.55)	-0.030*** (-5.63)		-0.048*** (-9.65)	-0.043*** (-8.34)	-0.030*** (-5.66)		-0.049*** (-9.72)	-0.044*** (-8.45)	-0.029*** (-5.51)	
quintile 5 SES (5th grade)		-0.058*** (-10.94)	-0.050*** (-8.51)	-0.029*** (-5.01)		-0.056*** (-10.62)	-0.047*** (-8.11)	-0.029*** (-4.96)		-0.059*** (-10.98)	-0.049*** (-8.42)	-0.029*** (-4.93)	
% of students belonging to an ethnic group in primary		0.045*** (7.00)	0.041*** (6.24)	0.031*** (3.85)		0.042*** (6.64)	0.038*** (5.77)	0.028*** (3.55)		0.046*** (7.19)	0.042*** (6.40)	0.032*** (3.92)	
% of students who have repeated a course in primary		-0.004 (-0.19)	-0.014 (-0.59)	-0.038 (-1.70)		-0.003 (-0.14)	-0.016 (-0.68)	-0.036 (-1.58)		-0.005 (-0.22)	-0.014 (-0.59)	-0.038 (-1.66)	
years of operation		-0.000* (-2.43)	-0.000** (-2.63)	-0.000* (-2.26)		-0.000** (-2.61)	-0.000** (-2.86)	-0.000* (-2.57)		-0.000* (-2.32)	-0.000* (-2.55)	-0.000* (-2.14)	
% of students in a traditional model of teaching (1)		-0.012** (-3.07)	-0.014*** (-3.74)	-0.015*** (-3.93)		-0.012** (-3.25)	-0.016*** (-4.18)	-0.015*** (-3.82)		-0.011** (-2.92)	-0.013*** (-3.50)	-0.014*** (-3.52)	
double-shift		0.014** (2.90)	0.011* (2.20)	0.004 (0.76)		0.014** (3.01)	0.010* (1.97)	0.004 (0.88)		0.015*** (3.31)	0.013** (2.66)	0.006 (1.22)	
only morning shift		0.017*** (3.71)	0.017*** (3.63)	0.010* (2.09)		0.013** (2.53)	0.013** (2.80)	0.009 (1.87)		0.018*** (3.92)	0.018*** (3.84)	0.010* (2.13)	
other type of school day		0.002 (0.37)	0.002 (0.36)	-0.004 (-0.81)		0.004 (0.79)	0.003 (0.67)	-0.000 (-0.09)		0.004 (0.92)	0.004 (0.90)	-0.001 (-0.23)	
distance school site-municipality (1-5 km)		-0.005 (-1.53)	-0.004 (-1.21)	-0.002 (-0.66)		-0.006 (-1.74)	-0.006 (-1.64)	-0.003 (-0.73)		-0.008* (-2.14)	-0.006 (-1.64)	-0.004 (-1.20)	
distance school site-municipality (5-20 km)		-0.005 (-1.39)	-0.004 (-0.82)	-0.002 (-0.41)		-0.005 (-1.18)	-0.003 (-0.79)	-0.001 (-0.22)		-0.007 (-1.88)	-0.005 (-1.10)	-0.003 (-0.78)	
distance school site-municipality (20-100 km)		0.008 (1.55)	0.010 (1.90)	0.010 (1.90)		0.010 (1.85)	0.012* (2.11)	0.012* (2.14)		0.007 (1.30)	0.010 (1.79)	0.009 (1.69)	
distance school site-municipality (>100 km)		-0.008 (-0.54)	-0.007 (-0.44)	-0.004 (-0.31)		-0.003 (-0.17)	-0.001 (-0.05)	-0.001 (-0.07)		-0.006 (-0.41)	-0.004 (-0.29)	-0.002 (-0.13)	
Total per student spending in the ETC			-0.000*** (-5.62)				-0.000*** (-7.03)				-0.000*** (-5.41)		
% low-SES students in the ETC (5th grade) (2)			-0.045* (-2.12)				-0.075*** (-3.46)				-0.034 (-1.58)		
total public enrollment ETC			-0.000 (-1.71)				-0.000* (-1.99)				-0.000 (-1.83)		
Percentage of rural students in the ETC			0.043** (2.82)				0.058*** (3.79)				0.039* (2.56)		
<b>Heterogeneous effects by availability of the next level</b>													
1 site: with lower secondary						-0.150*** (-16.34)	-0.073*** (-8.32)	-0.083*** (-9.31)	-0.088*** (-9.66)				
2-5 sites: no changes with integration (3)						-0.121*** (-13.01)	-0.058*** (-6.53)	-0.071*** (-7.83)	-0.072*** (-7.68)				
2-5 sites: integration make available lower secondary						-0.114*** (-12.33)	-0.047*** (-5.42)	-0.060*** (-6.72)	-0.063*** (-6.84)				
6 or more sites: no changes with integration						-0.101*** (-10.15)	-0.061*** (-6.82)	-0.072*** (-7.95)	-0.072*** (-7.34)				
6 or more sites: integration make available lower secondary						-0.087*** (-9.20)	-0.043*** (-4.75)	-0.053*** (-5.84)	-0.049*** (-4.95)				
<b>Heterogeneous effects by distance to the main site</b>													
2-5 sites & < 1km to principal site										-0.023*** (-6.05)	-0.006 (-1.69)	-0.009** (-2.72)	0.003 (1.03)
2-5 sites & 2-5 km to principal site										0.006 (1.17)	0.006 (1.18)	0.001 (0.23)	0.017*** (3.33)
2-5 sites & >5km to principal site										0.026*** (3.61)	-0.004 (-0.62)	-0.009 (-1.26)	0.009 (1.40)
6 or more sites & <1km to principal site										-0.011* (-2.47)	-0.011* (-2.51)	-0.014** (-3.13)	0.006 (1.46)
6 or more sites & 2-5 km to principal site										0.014** (2.67)	0.003 (0.41)	-0.000 (-0.07)	0.021*** (3.46)
6 or more sites & >5km to principal site										0.043*** (7.28)	0.010 (1.63)	0.007 (1.12)	0.031*** (5.13)
constant	0.093*** (27.40)	0.124*** (15.34)	0.183*** (12.17)	0.101*** (11.86)	0.198*** (22.21)	0.168*** (14.91)	0.261*** (14.26)	0.170*** (13.80)	0.093*** (27.40)	0.122*** (15.07)	0.175*** (11.50)	0.096*** (11.09)	
Fixed effects ETC level	No	No	No	Yes	No	No	No	Yes	No	No	No	Yes	
N	16566	10654	10654	10654	16566	10654	10654	10654	16566	10654	10654	10654	
r <sup>2</sup>	0.007	0.081	0.085	0.151	0.037	0.093	0.099	0.164	0.027	0.083	0.087	0.155	
bic	-1.88e+04	-1.65e+04	-1.65e+04	-1.72e+04	-1.91e+04	-1.65e+04	-1.67e+04	-1.73e+04	-1.89e+04	-1.65e+04	-1.66e+04	-1.72e+04	
Δbic	-1.88e+04	-1.63e+04	-1.64e+04	-1.63e+04	-1.90e+04	-1.65e+04	-1.65e+04	-1.65e+04	-1.89e+04	-1.63e+04	-1.63e+04	-1.63e+04	

1 Statistics in parentheses  
 \*p<0.05, \*\* p<0.01, \*\*\* p<0.001  
 Notes:  
 ETC: Certified Technical Entry  
 (1) The opposite site of the traditional model is a flexible education model, which has specific educational materials and defined training processes. These models are designed to serve diverse populations, in situations of vulnerability and who have difficulty accessing the regular model (e.g. Escuela Nueva, Post-Primaria, Telesecundaria).  
 (2) low-SES student: student whose mother didn't complete secondary education (5th grade)  
 (3) It includes sites with lower secondary and those not having lower secondary in the school  
 The categories omitted are: 1 site; quintile 1 SES (5th grade); full-time school day; distance school site-municipality (< 1 km); 1 site: no lower secondary

Table 10. Main regression for dropout rate in 9th grade

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2-5 sites	0.006** (2.85)	0.010*** (3.67)	0.010*** (3.59)	0.010*** (3.39)								
6 or more sites	0.032*** (6.83)	0.014*** (3.33)	0.015*** (3.44)	0.014** (2.95)								
total enrollment	0.000 (0.32)	0.000 (0.82)	-0.000 (-0.40)		0.000 (0.67)	0.000 (1.16)	-0.000 (-0.03)		0.000 (0.47)	0.000 (0.94)	-0.000 (-0.27)	
single-teacher	0.026* (2.53)	0.026* (2.54)	0.019 (1.89)		0.025* (2.18)	0.025* (2.18)	0.018 (1.59)		0.023* (2.07)	0.024* (2.09)	0.017 (1.56)	
rural	-0.005 (-1.02)	-0.006 (-1.11)	-0.001 (-0.09)		-0.005 (-0.88)	-0.005 (-1.00)	0.000 (0.03)		-0.005 (-0.99)	-0.006 (-1.08)	-0.000 (-0.04)	
quintile 2 SES (9th grade)	-0.006 (-1.41)	-0.006 (-1.47)	-0.005 (-1.08)		-0.006 (-1.39)	-0.006 (-1.44)	-0.004 (-1.05)		-0.006 (-1.45)	-0.006 (-1.51)	-0.005 (-1.12)	
quintile 3 SES (9th grade)	-0.011* (-2.19)	-0.013* (-2.35)	-0.004 (-0.72)		-0.011* (-2.16)	-0.012* (-2.29)	-0.004 (-0.68)		-0.011* (-2.18)	-0.013* (-2.33)	-0.004 (-0.70)	
quintile 4 SES (9th grade)	-0.025*** (-4.29)	-0.023*** (-3.72)	-0.007 (-1.20)		-0.024*** (-4.23)	-0.022*** (-3.63)	-0.007 (-1.14)		-0.024*** (-4.26)	-0.023*** (-3.68)	-0.007 (-1.19)	
quintile 5 SES (9th grade)	-0.027*** (-3.99)	-0.025*** (-3.52)	-0.009 (-1.19)		-0.027*** (-3.96)	-0.025*** (-3.45)	-0.009 (-1.16)		-0.026*** (-3.96)	-0.025*** (-3.49)	-0.009 (-1.17)	
% of students belonging to an ethnic group in lower secondary	0.018** (3.22)	0.017** (2.92)	0.023** (3.11)		0.019*** (3.36)	0.018** (3.02)	0.023** (3.15)		0.019*** (3.36)	0.018** (3.05)	0.023** (3.14)	
% of students who have repeated a course in lower secondary	-0.029 (-1.73)	-0.024 (-1.47)	-0.049** (-2.86)		-0.022 (-1.89)	-0.027 (-1.63)	-0.052** (-2.98)		-0.030 (-1.78)	-0.025 (-1.52)	-0.050** (-2.86)	
years of operation	-0.000*** (-4.65)	-0.000*** (-4.65)	-0.000*** (-3.78)		-0.000*** (-4.59)	-0.000*** (-4.60)	-0.000*** (-3.74)		-0.000*** (-4.62)	-0.000*** (-4.62)	-0.000*** (-3.76)	
% of students in a traditional model of teaching (1)	-0.008* (-2.02)	-0.009* (-2.14)	-0.010* (-2.23)		-0.008 (-1.96)	-0.008* (-2.06)	-0.009* (-2.16)		-0.008 (-1.91)	-0.008* (-2.02)	-0.010* (-2.17)	
double-shift	0.019** (3.21)	0.013* (2.16)	0.002 (0.35)		0.019** (3.20)	0.013* (2.19)	0.002 (0.38)		0.019** (3.25)	0.014* (2.22)	0.003 (0.39)	
only morning shift	0.020*** (3.42)	0.017** (2.83)	0.007 (1.09)		0.021*** (3.44)	0.018** (2.85)	0.007 (1.11)		0.021*** (3.42)	0.018** (2.83)	0.007 (1.09)	
other type of school day	0.013* (2.19)	0.010 (1.65)	0.000 (0.01)		0.013* (2.25)	0.010 (1.72)	0.001 (0.11)		0.013* (2.26)	0.010 (1.72)	0.000 (0.07)	
distance school site-municipality (1-5 km)	-0.001 (-0.23)	-0.003 (-0.64)	0.002 (0.51)		-0.001 (-0.34)	-0.003 (-0.70)	0.002 (0.43)		-0.001 (-0.18)	-0.003 (-0.58)	0.003 (0.54)	
distance school site-municipality (5-20 km)	-0.003 (-0.60)	-0.002 (-0.34)	0.000 (0.04)		-0.003 (-0.68)	-0.002 (-0.36)	-0.000 (-0.01)		-0.003 (-0.72)	-0.002 (-0.43)	-0.000 (-0.04)	
distance school site-municipality (20-100 km)	0.006 (1.14)	0.008 (1.32)	0.008 (1.24)		0.006 (1.11)	0.008 (1.32)	0.008 (1.22)		0.006 (1.04)	0.007 (1.23)	0.007 (1.15)	
distance school site-municipality (>100 km)	0.024 (1.35)	0.026 (1.44)	0.031 (1.62)		0.025 (1.36)	0.026 (1.46)	0.031 (1.64)		0.024 (1.34)	0.026 (1.43)	0.030 (1.62)	
Total per student spending in the ETC		-0.000** (-2.66)				-0.000* (-2.54)				-0.000** (-2.59)		
% low-SES students in the ETC (5th grade) (2)		-0.018 (-0.76)				-0.017 (-0.72)				-0.017 (-0.74)		
total public enrollment ETC		-0.000*** (-3.92)				-0.000*** (-3.99)				-0.000*** (-3.95)		
Percentage of rural students in the ETC		0.001 (0.07)				0.001 (0.11)				0.001 (0.07)		
<b>Heterogeneous effects by availability of the next level</b>												
1 site: with upper secondary					-0.074*** (-6.63)	0.002 (0.25)	-0.001 (-0.07)	0.000 (0.01)				
2-5 sites: no changes with integration (3)					-0.056*** (-5.05)	0.011 (1.17)	0.008 (0.87)	0.009 (0.95)				
2-5 sites: integration make available upper secondary					-0.040** (-3.13)	0.040* (2.40)	0.036* (2.16)	0.037* (2.30)				
6 or more sites: no changes with integration					-0.037** (-3.19)	0.017 (1.73)	0.014 (1.50)	0.014 (1.46)				
6 or more sites: integration make available upper secondary					-0.017 (-1.27)	0.018 (1.26)	0.016 (1.13)	0.017 (1.20)				
<b>Heterogeneous effects by distance to the main site</b>												
2-5 sites & <1km to principal site									0.006 (1.92)	0.009** (3.35)	0.009** (3.31)	0.009** (3.18)
2-5 sites & 2-5 km to principal site									0.024** (2.91)	0.016 (1.78)	0.015 (1.62)	0.017* (2.00)
2-5 sites & >5km to principal site									0.035** (2.66)	0.031 (1.78)	0.030 (1.72)	0.023 (1.44)
6 or more sites & <1km to principal site									0.018*** (5.03)	0.015*** (3.53)	0.015*** (3.61)	0.015** (3.06)
6 or more sites & 2-5 km to principal site									0.019** (2.86)	0.006 (0.46)	0.006 (0.55)	0.005 (0.44)
6 or more sites & >5km to principal site									0.062*** (5.48)	0.022* (2.01)	0.022* (2.03)	0.020 (1.95)
constant	0.050*** (22.52)	0.053*** (6.18)	0.094*** (5.32)	0.044*** (4.91)	0.113*** (30.30)	0.049*** (3.99)	0.042*** (4.51)	0.091*** (3.38)	0.050*** (22.51)	0.051*** (5.96)	0.091*** (5.19)	0.043*** (4.73)
Fixed effects ETC level	No	No	No	Yes	No	No	Yes	No	No	No	No	Yes
N	7719	5280	5280	5280	7719	5280	5280	5280	7719	5280	5280	5280
r2	0.011	0.037	0.040	0.102	0.021	0.039	0.042	0.103	0.022	0.038	0.041	0.103
aic	-9889.391	-9375.934	-9386.399	-9556.473	-9964.765	-9378.213	-9387.751	-9558.235	-9973.501	-9374.347	-9384.011	-9552.719
bic	-9868.537	-9237.929	-9222.107	-8800.730	-9923.056	-9220.493	-9203.744	-8782.777	-9924.841	-9210.055	-9193.432	-8770.689

t statistics in parentheses  
\*p<0.05; \*\*p<0.01; \*\*\*p<0.001

Notes:

ETC: Certified Territorial Entity

(1) The opposite of the traditional model is a flexible education model, which has specific educational materials and defined training processes. These models are designed to serve diverse populations, in situations of vulnerability and who have difficulty accessing the regular model (e.g. Escuela Nueva, Post-Primaria, Telesecundaria).

(2) low-SES student: student whose mother didn't complete secondary education (9th grade)

(3) It includes sites with upper secondary and those not having upper secondary in the school

The categories omitted are: 1 site; quintile 1 SES (9th grade); full-time school day; distance school site-municipality (<1 km); 1 site: no upper secondary

Table 11. Main regression for average monthly basic salary (in millions of COP)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
2-5 sites	-0.067*** (-4.98)	-0.101*** (-7.22)	-0.041** (-2.86)	0.083*** (6.38)									
6 or more sites	-0.331*** (-23.79)	-0.206*** (-12.48)	-0.158*** (-9.56)	0.032 (1.87)									
total enrollment	-0.000*** (-9.13)	-0.000*** (-7.96)	-0.000*** (-4.13)		-0.000** (-2.93)	-0.000** (-2.62)	-0.000 (-0.76)		-0.000*** (-9.85)	-0.000*** (-8.47)	-0.000*** (-4.65)		
single-teacher	-0.067*** (-5.59)	-0.081*** (-6.93)	-0.072*** (-6.32)		-0.092*** (-7.30)	-0.101*** (-8.11)	-0.087*** (-7.29)		-0.045*** (-3.67)	-0.065*** (-5.33)	-0.062*** (-5.18)		
rural	-0.117*** (-7.29)	-0.128*** (-7.71)	-0.121*** (-7.31)		-0.112*** (-6.78)	-0.123*** (-7.22)	-0.110*** (-6.42)		-0.114*** (-7.15)	-0.125*** (-7.58)	-0.121*** (-7.34)		
quintile 2 SES (5th grade)	0.053*** (4.02)	0.055*** (4.21)	0.078*** (6.11)		0.061*** (4.64)	0.061*** (4.70)	0.081*** (6.37)		0.049*** (3.73)	0.052*** (3.97)	0.075*** (5.88)		
quintile 3 SES (5th grade)	0.078*** (5.45)	0.086*** (5.97)	0.136*** (9.70)		0.088*** (6.18)	0.093*** (6.49)	0.138*** (9.89)		0.077*** (5.37)	0.084*** (5.88)	0.134*** (9.54)		
quintile 4 SES (5th grade)	0.118*** (6.78)	0.144*** (8.06)	0.215*** (11.89)		0.127*** (7.30)	0.148*** (8.30)	0.215*** (11.86)		0.118*** (6.77)	0.142*** (7.97)	0.213*** (11.76)		
quintile 5 SES (5th grade)	0.109*** (5.06)	0.169*** (7.31)	0.252*** (10.69)		0.135*** (6.34)	0.183*** (8.00)	0.252*** (10.73)		0.113*** (5.26)	0.169*** (7.32)	0.252*** (10.70)		
% of students belonging to an ethnic group in primary	-0.163*** (-7.43)	-0.174*** (-7.71)	-0.205*** (-7.68)		-0.171*** (-7.75)	-0.181*** (-8.03)	-0.207*** (-7.81)		-0.173*** (-7.90)	-0.180*** (-8.05)	-0.206*** (-7.76)		
% of students who have repeated a course in primary	-0.115 (-1.30)	-0.043 (-0.48)	-0.012 (-0.14)		-0.130 (-1.48)	-0.065 (-0.73)	-0.012 (-0.14)		-0.103 (-1.17)	-0.036 (-0.41)	-0.009 (-0.10)		
years of operation	0.002*** (7.18)	0.002*** (7.34)	0.001*** (6.71)		0.002*** (7.04)	0.002*** (7.27)	0.001*** (6.64)		0.002*** (7.04)	0.002*** (7.21)	0.001*** (6.62)		
% of students in a traditional model of teaching (1)	0.084*** (5.72)	0.114*** (7.72)	0.075*** (5.06)		0.084*** (5.65)	0.108*** (7.26)	0.077*** (5.19)		0.080*** (5.49)	0.110*** (7.43)	0.071*** (4.78)		
double-shift	0.006 (0.32)	0.068*** (3.50)	0.035 (1.65)		0.007 (0.37)	0.059** (3.02)	0.036 (1.70)		-0.004 (-0.19)	0.059** (3.02)	0.032 (1.49)		
only morning shift	0.067*** (3.86)	0.057** (3.24)	0.019 (0.88)		0.051** (2.94)	0.043* (2.37)	0.017 (0.81)		0.066*** (3.82)	0.058** (3.26)	0.021 (0.99)		
other type of school day	-0.007 (-0.36)	0.006 (0.30)	-0.031 (-1.47)		-0.002 (-0.10)	0.006 (0.28)	-0.023 (-1.10)		-0.019 (-0.93)	-0.003 (-0.13)	-0.035 (-1.66)		
distance school site-municipality (1-5 km)	0.015 (0.96)	0.062*** (3.84)	0.034* (2.11)		0.013 (0.82)	0.056** (3.48)	0.036* (2.18)		0.026 (1.68)	0.066*** (4.14)	0.037* (2.28)		
distance school site-municipality (5-20 km)	-0.145*** (-8.47)	-0.081*** (-4.53)	-0.105*** (-5.70)		-0.139*** (-8.21)	-0.082*** (-4.63)	-0.102*** (-5.54)		-0.123*** (-7.36)	-0.068*** (-3.85)	-0.094*** (-5.18)		
distance school site-municipality (20-100 km)	-0.347*** (-16.96)	-0.280*** (-13.30)	-0.284*** (-12.95)		-0.337*** (-16.63)	-0.277*** (-13.30)	-0.281*** (-12.82)		-0.322*** (-15.92)	-0.263*** (-12.55)	-0.271*** (-12.34)		
distance school site-municipality (>100 km)	-0.153* (-2.05)	-0.133 (-1.78)	-0.028 (-0.46)		-0.135 (-1.87)	-0.122 (-1.67)	-0.020 (-0.32)		-0.155* (-2.11)	-0.133 (-1.81)	-0.031 (-0.50)		
Total per student spending in the ETC		0.000*** (11.07)			0.000*** (9.99)				0.000*** (10.70)				
% low-SES students in the ETC (5th grade) (2)		0.748*** (7.60)			0.601*** (5.99)				0.715*** (7.22)				
total public enrollment ETC		-0.000* (-2.16)			-0.000** (-2.66)				-0.000* (-2.05)				
Percentage of rural students in the ETC		-0.151* (-2.26)			-0.092 (-1.35)				-0.145* (-2.16)				
<b>Heterogeneous effects by availability of the next level</b>													
1 site: with lower secondary					-0.102*** (-4.62)	-0.385*** (-15.16)	-0.306*** (-11.63)	-0.199*** (-6.52)					
2-5 sites: no changes with integration (3)					-0.143*** (-6.65)	-0.306*** (-12.73)	-0.216*** (-8.43)	-0.089** (-2.91)					
2-5 sites: integration make available lower secondary					-0.103*** (-4.81)	-0.291*** (-12.09)	-0.198*** (-7.72)	-0.057 (-1.85)					
6 or more sites: no changes with integration					-0.399*** (-16.44)	-0.425*** (-16.39)	-0.342*** (-12.77)	-0.154*** (-4.70)					
6 or more sites: integration make available lower secondary					-0.380*** (-17.77)	-0.360*** (-14.96)	-0.285*** (-11.28)	-0.099** (-3.08)					
<b>Heterogeneous effects by distance to the main site</b>													
2-5 sites & < 1km to principal site									0.026* (2.01)	-0.068*** (-5.06)	-0.020 (-1.47)	0.090*** (7.02)	
2-5 sites & 2-5 km to principal site									-0.117*** (-6.61)	-0.118*** (-5.89)	-0.045* (-2.20)	0.069*** (3.56)	
2-5 sites & >5km to principal site									-0.306*** (-13.90)	-0.196*** (-7.84)	-0.127*** (-5.04)	0.024 (0.99)	
6 or more sites & <1km to principal site									-0.196*** (-12.12)	-0.164*** (-9.81)	-0.130*** (-7.77)	0.040* (2.33)	
6 or more sites & 2-5 km to principal site									-0.276*** (-16.90)	-0.209*** (-9.94)	-0.154*** (-7.21)	0.032 (1.52)	
6 or more sites & >5km to principal site									-0.446*** (-28.75)	-0.380*** (-13.65)	-0.230*** (-10.67)	-0.025 (-1.16)	
constant	2.336*** (210.41)	2.415*** (79.62)	1.496*** (23.26)	1.991*** (61.65)	2.387*** (124.25)	2.592*** (73.90)	1.761*** (23.96)	2.136*** (50.75)	2.336*** (210.39)	2.404*** (80.39)	1.522*** (23.39)	2.001*** (61.68)	
Fixed effects ETC level	No	No	No	SI	No	No	SI	No	No	No	SI	No	
N	33184	18294	18294	18294	33184	18294	18294	18294	33184	18294	18294	18294	
r2	0.048	0.143	0.162	0.211	0.049	0.154	0.169	0.213	0.078	0.148	0.165	0.213	
aic	60865.006	29693.220	29297.899	28374.423	60838.159	29463.691	29156.565	28328.347	59834.970	29603.060	29239.311	28346.942	
bic	60890.236	29857.321	29493.257	29273.071	60888.618	29651.235	29375.366	29250.438	59893.839	29798.418	29465.926	29276.747	

t statistics in parentheses  
\*p<0.05; \*\*p<0.01; \*\*\*p<0.001

Notes:

ETC: Certified Technical Entity

(1) The opposite of the traditional model is a flexible education model, which has specific educational materials and defined training processes. These models are designed to serve diverse populations, in situations of vulnerability and who have difficulty accessing the regular model (e.g. Escuela Nueva, Post-Primaria, Telesecundaria).

(2) low-SES student: student whose mother didn't complete secondary education (5th grade)

The categories omitted are:

(3) It includes sites with lower secondary and those not having lower secondary in the school

The categories omitted are: 1 site; quintile 1 SES (5th grade); full-time school day; distance school site-municipality (< 1 km); 1 site: no lower secondary

Table 12. Main regression for percentage of teachers with permanent contracts

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2-5 sites	0.058*** (7.36)	-0.006 (-0.74)	-0.000 (-0.03)	0.050*** (5.93)								
6 or more sites	-0.057*** (-5.87)	-0.048*** (-4.59)	-0.044*** (-4.13)	0.017 (1.45)								
total enrollment	-0.000*** (-9.10)	-0.000*** (-8.83)	-0.000*** (-5.66)	-0.000*** (-5.66)	-0.000** (-2.79)	-0.000** (-2.90)	-0.000 (-1.30)	-0.000*** (-8.78)	-0.000*** (-8.43)	-0.000*** (-4.96)		
single-teacher	-0.010 (-1.38)	-0.014 (-1.94)	-0.012 (-1.72)		-0.027*** (-3.47)	-0.028*** (-3.64)	-0.023** (-3.16)	-0.009 (-1.14)	-0.014 (-1.83)	-0.013 (-1.89)		
rural	0.014 (1.66)	-0.000 (-0.03)	0.004 (0.45)		0.025** (2.78)	0.010 (0.99)	0.016 (1.74)	0.014 (1.61)	-0.001 (-0.09)	0.003 (0.38)		
quintile 2 SES (5th grade)	0.077*** (8.86)	0.077*** (8.97)	0.073*** (9.21)		0.080*** (9.18)	0.080*** (9.29)	0.075*** (9.47)	0.077*** (8.83)	0.076*** (8.95)	0.073*** (9.22)		
quintile 3 SES (5th grade)	0.102*** (10.60)	0.102*** (10.81)	0.098*** (11.10)		0.104*** (10.75)	0.104*** (10.99)	0.099*** (11.18)	0.102*** (10.60)	0.102*** (10.82)	0.098*** (11.08)		
quintile 4 SES (5th grade)	0.100*** (9.59)	0.102*** (9.52)	0.106*** (10.04)		0.099*** (9.48)	0.101*** (9.48)	0.104*** (9.87)	0.099*** (9.59)	0.101*** (9.53)	0.105*** (10.00)		
quintile 5 SES (5th grade)	0.063*** (5.24)	0.065*** (4.76)	0.080*** (5.98)		0.066*** (5.51)	0.069*** (5.07)	0.077*** (5.82)	0.064*** (5.24)	0.065*** (4.77)	0.080*** (5.98)		
% of students belonging to an ethnic group in primary	-0.203*** (-9.65)	-0.234*** (-10.10)	-0.228*** (-9.97)		-0.205*** (-9.72)	-0.217*** (-10.24)	-0.231*** (-10.13)	-0.204*** (-9.66)	-0.214*** (-10.09)	-0.228*** (-9.99)		
% of students who have repeated a course in primary	-0.055 (-0.79)	-0.048 (-0.65)	-0.074 (-1.10)		-0.061 (-0.88)	-0.058 (-0.78)	-0.074 (-1.09)	-0.054 (-0.78)	-0.047 (-0.64)	-0.075 (-1.11)		
years of operation	0.001*** (5.13)	0.001*** (5.06)	0.001*** (6.19)		0.001*** (5.17)	0.001*** (5.09)	0.001*** (6.20)	0.001*** (5.05)	0.001*** (4.99)	0.001*** (6.19)		
% of students in a traditional model of teaching (1)	0.076*** (9.15)	0.071*** (8.59)	0.058*** (6.80)		0.073*** (8.70)	0.068*** (8.05)	0.058*** (6.79)	0.076*** (9.13)	0.072*** (8.62)	0.059*** (6.86)		
double-shift	0.015 (1.20)	0.028* (2.22)	0.032* (2.30)		0.019 (1.55)	0.029* (2.28)	0.035* (2.57)	0.016 (1.34)	0.031* (2.40)	0.035* (2.50)		
only morning shift	-0.019 (-1.64)	-0.026* (-2.20)	-0.004 (-0.27)		-0.023 (-1.93)	-0.030* (-2.45)	-0.004 (-0.26)	-0.018 (-1.52)	-0.025* (-2.06)	-0.003 (-0.21)		
other type of school day	-0.019 (-1.59)	-0.021 (-1.73)	-0.003 (-0.22)		-0.010 (-0.87)	-0.014 (-1.16)	0.005 (0.41)	-0.018 (-1.52)	-0.019 (-1.57)	-0.001 (-0.06)		
distance school site-municipality (1-5 km)	0.020* (2.11)	0.033** (3.23)	0.021* (2.50)		0.020* (2.07)	0.032** (3.09)	0.022** (2.66)	0.017 (1.80)	0.029** (2.88)	0.017 (1.93)		
distance school site-municipality (5-20 km)	-0.023* (-2.04)	-0.007 (-0.59)	-0.019 (-1.93)		-0.020 (-1.86)	-0.006 (-0.56)	-0.017 (-1.73)	-0.021* (-1.97)	-0.006 (-0.57)	-0.020* (-2.02)		
distance school site-municipality (20-100 km)	-0.107*** (-6.98)	-0.088*** (-5.50)	-0.096*** (-6.89)		-0.104*** (-6.77)	-0.087*** (-5.41)	-0.095*** (-6.79)	-0.103*** (-6.74)	-0.085*** (-5.32)	-0.095*** (-6.84)		
distance school site-municipality (>100 km)	-0.077 (-1.54)	-0.078 (-1.55)	-0.123* (-2.45)		-0.069 (-1.40)	-0.071 (-1.43)	-0.118* (-2.37)	-0.074 (-1.48)	-0.075 (-1.48)	-0.122* (-2.41)		
Total per student spending in the ETC		0.000*** (7.71)			0.000*** (6.66)			0.000*** (7.72)				
% low-SES students in the ETC (5th grade) (2)		-0.176* (-2.32)			-0.212** (-2.68)			-0.169* (-2.21)				
total public enrollment ETC		-0.000 (-0.34)			-0.000 (-0.48)			-0.000 (-0.31)				
Percentage of rural students in the ETC		0.194*** (3.47)			0.213*** (3.74)			0.190*** (3.40)				
<b>Heterogeneous effects by availability of the next level</b>												
1 site: with lower secondary					0.044*** (3.50)	-0.136*** (-9.45)	-0.128*** (-8.24)	-0.078*** (-4.11)				
2-5 sites: no changes with integration (3)					0.065*** (5.56)	-0.088*** (-6.69)	-0.083*** (-5.56)	-0.024 (-1.30)				
2-5 sites: integration make available lower secondary					0.088*** (7.87)	-0.060*** (-4.79)	-0.053*** (-3.74)	0.011 (0.59)				
6 or more sites: no changes with integration					-0.048*** (-3.28)	-0.149*** (-9.52)	-0.139*** (-8.42)	-0.068*** (-3.32)				
6 or more sites: integration make available lower secondary					-0.033** (-2.58)	-0.086*** (-6.11)	-0.085*** (-5.52)	-0.020 (-1.01)				
<b>Heterogeneous effects by distance to the main site</b>												
2-5 sites & < 1km to principal site								0.084*** (11.13)	-0.009 (-1.18)	-0.005 (-0.54)	0.046*** (5.45)	
2-5 sites & 2-5 km to principal site								0.066*** (6.87)	0.010 (0.96)	0.016 (1.44)	0.074*** (6.50)	
2-5 sites & >5km to principal site								-0.032* (-2.29)	-0.019 (-1.23)	-0.010 (-0.62)	0.049** (3.03)	
6 or more sites & <1km to principal site								-0.023 (-1.91)	-0.045*** (-4.24)	-0.044*** (-4.10)	0.018 (1.55)	
6 or more sites & 2-5 km to principal site								-0.003 (-0.28)	-0.031* (-2.47)	-0.026* (-2.02)	0.036** (2.68)	
6 or more sites & >5km to principal site								-0.110*** (-9.21)	-0.063*** (-4.67)	-0.057*** (-4.09)	0.013 (0.88)	
constant	0.824*** (128.35)	0.824*** (48.16)	0.655*** (14.63)	0.740*** (33.30)	0.803*** (81.67)	0.877*** (46.33)	0.748*** (15.00)	0.786*** (28.88)	0.824*** (128.34)	0.823*** (48.06)	0.651*** (14.47)	0.737*** (33.09)
Fixed effects ETC level	No	No	No	SI	No	No	SI	No	No	SI	No	SI
N	37280	19629	19629	19629	37280	19629	19629	37280	19629	19629	37280	19629
r2	0.018	0.112	0.122	0.170	0.019	0.120	0.128	0.173	0.033	0.114	0.123	0.170
aic	32341.570	8904.795	8705.381	7783.882	32320.957	8744.851	8576.956	7716.400	31782.305	8885.781	8689.259	7770.541
bic	32367.149	9070.375	8902.500	8690.630	32372.115	8934.085	8797.730	8646.802	31841.988	9082.900	8917.917	8708.828

t statistics in parentheses  
 \*p<0.05; \*\*p<0.01; \*\*\*p<0.001  
 Notes:  
 ETC: Certified Territorial Entity  
 (1) The opposite of the traditional model is a flexible education model, which has specific educational materials and defined training processes. These models are designed to serve diverse populations, in situations of vulnerability and who have difficulty accessing the regular model (e.g. Escuela Nueva, Post-Primaria, Telesecundaria).  
 (2) low-SES student: student whose mother didn't complete secondary education (5th grade)  
 The categories omitted are:  
 (3) It includes sites with lower secondary and those not having lower secondary in the school  
 The categories omitted are: 1 site; quintile 1 SES (5th grade); full-time school day; distance school site-municipality (< 1 km); 1 site: no lower secondary

Table 13. Main regression for percentage of teachers over 40 years in primary

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2-5 sites	-0.027** (-2.85)	-0.063*** (-6.25)	-0.034** (-3.19)	0.038** (3.20)								
6 or more sites	-0.177*** (-18.81)	-0.134*** (-11.68)	-0.111*** (-9.56)	-0.003 (-0.23)								
total enrollment	-0.000*** (-10.57)	-0.000*** (-9.17)	-0.000*** (-5.80)	-0.000*** (-4.00)	-0.000*** (-6.48)	-0.000*** (-5.65)	-0.000*** (-3.74)	-0.000*** (-10.73)	-0.000*** (-9.19)	-0.000*** (-5.68)		
single-teacher	-0.021* (-2.38)	-0.026** (-3.05)	-0.017* (-2.00)		-0.038*** (-4.15)	-0.040*** (-4.41)	-0.027** (-3.12)	-0.014 (-1.55)	-0.023* (-2.56)	-0.016 (-1.86)		
rural	-0.071*** (-5.35)	-0.090*** (-6.70)	-0.090*** (-6.93)		-0.066*** (-4.81)	-0.084*** (-6.08)	-0.082*** (-6.12)	-0.070*** (-5.31)	-0.089*** (-6.68)	-0.090*** (-6.97)		
quintile 2 SES (5th grade)	0.027** (2.75)	0.029** (2.97)	0.035*** (3.74)		0.030** (3.11)	0.032** (3.28)	0.037*** (3.93)	0.025** (2.61)	0.028** (2.88)	0.035*** (3.71)		
quintile 3 SES (5th grade)	0.038*** (3.64)	0.045*** (4.33)	0.064*** (6.33)		0.042*** (4.00)	0.065*** (4.60)	0.065*** (6.39)	0.038*** (3.58)	0.045*** (4.28)	0.064*** (6.30)		
quintile 4 SES (5th grade)	0.033** (2.62)	0.056*** (4.39)	0.101*** (7.87)		0.035** (2.76)	0.057*** (4.44)	0.100*** (7.76)	0.033** (2.59)	0.056*** (4.35)	0.101*** (7.85)		
quintile 5 SES (5th grade)	0.001 (0.07)	0.059** (3.09)	0.121*** (6.26)		0.011 (0.61)	0.064** (3.41)	0.119*** (6.18)	0.002 (0.13)	0.058* (3.09)	0.121*** (6.26)		
% of students belonging to an ethnic group in primary	-0.051** (-3.05)	-0.077*** (-4.43)	-0.083*** (-4.38)		-0.055** (-3.26)	-0.081*** (-4.66)	-0.086*** (-4.57)	-0.054** (-3.22)	-0.079*** (-4.52)	-0.083*** (-4.40)		
% of students who have repeated a course in primary	0.023 (0.45)	0.058 (1.17)	0.066 (1.27)		0.015 (0.29)	0.047 (0.95)	0.066 (1.27)	0.026 (0.51)	0.059 (1.19)	0.066 (1.28)		
years of operation	0.001*** (7.07)	0.001*** (7.12)	0.001*** (6.54)		0.001*** (6.96)	0.001*** (7.07)	0.001*** (6.52)	0.001*** (6.98)	0.001*** (7.05)	0.001*** (6.52)		
% of students in a traditional model of teaching (1)	0.057*** (5.22)	0.068*** (6.21)	0.048*** (4.28)		0.054*** (4.98)	0.064*** (5.82)	0.048*** (4.27)	0.056*** (5.14)	0.068*** (6.13)	0.048*** (4.25)		
double-shift	0.055*** (3.66)	0.091*** (5.96)	0.050** (3.03)		0.058*** (3.86)	0.090*** (5.87)	0.053** (3.23)	0.052*** (3.43)	0.089*** (5.79)	0.050** (3.04)		
only morning shift	0.099*** (8.27)	0.085*** (6.92)	0.052*** (3.60)		0.093*** (7.75)	0.080*** (6.48)	0.053*** (3.63)	0.099*** (8.24)	0.085*** (6.93)	0.053*** (3.63)		
other type of school day	0.039** (2.68)	0.041** (2.81)	0.017 (1.13)		0.046** (3.16)	0.046** (3.14)	0.025 (1.65)	0.035* (2.39)	0.039** (2.67)	0.017 (1.13)		
distance school site-municipality (1-5 km)	-0.013 (-1.11)	0.026* (2.17)	0.027* (2.25)		-0.014 (-1.21)	0.023* (1.98)	0.028* (2.33)	-0.009 (-0.79)	0.026* (2.15)	0.026* (2.15)		
distance school site-municipality (5-20 km)	-0.084*** (-6.76)	-0.034** (-2.62)	-0.034** (-2.60)		-0.082*** (-6.59)	-0.034** (-2.65)	-0.033* (-2.48)	-0.077*** (-6.17)	-0.031* (-2.39)	-0.033* (-2.52)		
distance school site-municipality (20-100 km)	-0.181*** (-11.85)	-0.127*** (-8.22)	-0.110*** (-6.87)		-0.177*** (-11.62)	-0.126*** (-8.18)	-0.109*** (-6.82)	-0.174*** (-11.31)	-0.123*** (-7.91)	-0.109*** (-6.74)		
distance school site-municipality (>100 km)	-0.121* (-2.09)	-0.105 (-1.80)	-0.054 (-0.93)		-0.111 (-1.95)	-0.098 (-1.71)	-0.051 (-0.89)	-0.122* (-2.11)	-0.105 (-1.80)	-0.054 (-0.93)		
Total per student spending in the ETC		0.000*** (8.88)			0.000*** (7.94)			0.000*** (8.77)				
% low-SES students in the ETC (5th grade) (2)		0.290*** (3.72)			0.241** (3.01)			0.283*** (3.60)				
total public enrollment ETC		-0.000*** (-4.63)			-0.000*** (-4.80)			-0.000*** (-4.60)				
Percentage of rural students in the ETC		0.099 (1.90)			0.121* (2.29)			0.101 (1.93)				
<b>Heterogeneous effects by availability of the next level</b>												
1 site: with lower secondary					-0.081*** (-5.43)	-0.190*** (-10.48)	-0.146*** (-7.70)	-0.070** (-3.12)				
2-5 sites: no changes with integration (3)					-0.090*** (-6.54)	-0.163*** (-10.27)	-0.118*** (-6.81)	-0.022 (-0.99)				
2-5 sites: integration make available lower secondary					-0.050*** (-3.82)	-0.155*** (-10.01)	-0.105*** (-6.23)	-0.007 (-0.30)				
6 or more sites: no changes with integration					-0.239*** (-16.03)	-0.259*** (-15.11)	-0.214*** (-12.00)	-0.086*** (-3.53)				
6 or more sites: integration make available lower secondary					-0.209*** (-16.15)	-0.200*** (-13.23)	-0.162*** (-10.07)	-0.036 (-1.55)				
<b>Heterogeneous effects by distance to the main site</b>												
2-5 sites & < 1km to principal site								0.004 (0.38)	-0.052*** (-4.99)	-0.029** (-2.64)	0.037** (3.12)	
2-5 sites & 2-5 km to principal site								-0.034** (-2.81)	-0.071*** (-5.05)	-0.036* (-2.46)	0.041* (2.56)	
2-5 sites & >5km to principal site								-0.108*** (-7.28)	-0.089*** (-4.98)	-0.052** (-2.86)	0.034 (1.73)	
6 or more sites & <1km to principal site								-0.124*** (-10.53)	-0.121*** (-9.55)	-0.106*** (-8.43)	-0.002 (-0.15)	
6 or more sites & 2-5 km to principal site								-0.143*** (-13.09)	-0.134*** (-9.29)	-0.106*** (-7.18)	0.002 (0.14)	
6 or more sites & >5km to principal site								-0.226*** (-21.72)	-0.158*** (-11.09)	-0.116*** (-8.79)	-0.010 (-0.57)	
constant	0.661*** (87.61)	0.696*** (30.05)	0.177*** (3.35)	0.419*** (16.57)	0.699*** (61.56)	0.781*** (30.72)	0.294*** (5.02)	0.466*** (15.02)	0.661*** (87.60)	0.693*** (30.10)	0.182*** (3.43)	0.420*** (16.45)
Fixed effects ETC level	No	No	No	SI	No	No	No	SI	No	No	SI	SI
N	36721	19629	19629	19629	36721	19629	19629	19629	36721	19629	19629	19629
r2	0.027	0.074	0.089	0.123	0.028	0.080	0.093	0.124	0.035	0.075	0.090	0.123
aic	46268.532	22254.275	21932.743	21378.599	46215.125	22139.330	21862.444	21352.674	45949.831	22244.553	21933.430	21384.922
bic	46294.065	22410.855	22129.862	22285.346	46266.192	22328.565	22083.218	22383.076	46009.409	22441.672	22162.088	22323.206

t statistics in parentheses  
 \*p<0.05; \*\*p<0.01; \*\*\*p<0.001  
 Notes:  
 ETC: Certified Technical Entity  
 (1) The opposite of the traditional model is a flexible education model, which has specific educational materials and defined training processes. These models are designed to serve diverse populations, in situations of vulnerability and who have difficulty accessing the regular model (e.g. Escuela Nueva, Post-Primaria, Telesecundaria).  
 (2) low-SES student: student whose mother didn't complete secondary education (5th grade)  
 The categories omitted are:  
 (3) It includes sites with lower secondary and those not having lower secondary in the school  
 The categories omitted are: 1 site; quintile 1 SES (5th grade); full-time school day; distance school site-municipality (< 1 km); 1 site: no lower secondary

Table 14. Main regression for percentage of teachers over 40 years in lower secondary

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2-5 sites	0.004 (0.38)	0.012 (0.96)	0.011 (0.90)	0.024 (1.95)								
6 or more sites	-0.146*** (-12.08)	-0.042** (-2.97)	-0.047** (-3.25)	-0.000 (-0.02)								
total enrollment		-0.000** (-3.01)	-0.000* (-2.28)	-0.000 (-0.64)		-0.000** (-2.92)	-0.000* (-2.15)	-0.000 (-0.54)		-0.000** (-3.05)	-0.000* (-2.28)	-0.000 (-0.60)
single-teacher		0.029 (1.01)	0.043 (1.46)	0.031 (1.07)		0.024 (0.77)	0.034 (1.09)	0.022 (0.72)		0.017 (0.55)	0.026 (0.84)	0.016 (0.51)
rural		-0.064*** (-4.44)	-0.070*** (-4.81)	-0.055*** (-3.71)		-0.064*** (-4.49)	-0.071*** (-4.85)	-0.055*** (-3.68)		-0.063*** (-4.37)	-0.069*** (-4.76)	-0.054*** (-3.63)
quintile 2 SES (9th grade)		0.049*** (3.79)	0.049*** (3.67)	0.070*** (5.31)		0.050*** (3.85)	0.050*** (3.76)	0.071*** (5.38)		0.050*** (3.84)	0.050*** (3.75)	0.072*** (5.41)
quintile 3 SES (9th grade)		0.046** (2.89)	0.049** (3.00)	0.100*** (5.70)		0.046** (2.92)	0.050** (3.04)	0.100*** (5.74)		0.047** (2.96)	0.051** (3.08)	0.102*** (5.82)
quintile 4 SES (9th grade)		0.026 (1.41)	0.046* (2.27)	0.138*** (6.29)		0.026 (1.44)	0.047* (2.33)	0.139*** (6.31)		0.026 (1.41)	0.047* (2.32)	0.140*** (6.36)
quintile 5 SES (9th grade)		-0.015 (-0.43)	0.008 (0.21)	0.116** (3.11)		-0.012 (-0.36)	0.011 (0.29)	0.118** (3.15)		-0.015 (-0.42)	0.009 (0.25)	0.118** (3.17)
% of students belonging to an ethnic group in lower secondary		-0.015 (-0.79)	-0.028 (-1.43)	-0.034 (-1.43)		-0.016 (-0.84)	-0.028 (-1.46)	-0.033 (-1.41)		-0.014 (-0.76)	-0.027 (-1.38)	-0.032 (-1.38)
% of students who have repeated a course in lower secondary		-0.065 (-0.97)	-0.050 (-0.76)	0.056 (0.80)		-0.061 (-0.90)	-0.047 (-0.70)	0.059 (0.83)		-0.059 (-0.86)	-0.044 (-0.66)	0.063 (0.88)
years of operation		0.001*** (4.35)	0.001*** (4.20)	0.001*** (3.47)		0.001*** (4.28)	0.001*** (4.13)	0.001*** (3.43)		0.001*** (4.34)	0.001*** (4.20)	0.001*** (3.50)
% of students in a traditional model of teaching (1)		0.108*** (7.96)	0.113*** (8.23)	0.079*** (5.53)		0.109*** (7.98)	0.115*** (8.30)	0.082*** (5.66)		0.109*** (7.89)	0.115*** (8.24)	0.081*** (5.57)
double-shift		0.099*** (5.51)	0.101*** (5.49)	0.065*** (3.36)		0.099*** (5.53)	0.102*** (5.52)	0.066*** (3.41)		0.100*** (5.54)	0.103*** (5.58)	0.067*** (3.44)
only morning shift		0.104*** (6.23)	0.086*** (5.12)	0.047* (2.55)		0.104*** (6.24)	0.086*** (5.15)	0.048** (2.60)		0.105*** (6.28)	0.087*** (5.21)	0.048** (2.63)
other type of school day		0.045** (2.71)	0.033* (1.99)	0.004 (0.25)		0.046** (2.75)	0.034* (2.07)	0.006 (0.35)		0.046** (2.77)	0.035* (2.13)	0.007 (0.39)
distance school site-municipality (1-5 km)		0.002 (0.16)	0.011 (0.82)	0.003 (0.23)		0.002 (0.19)	0.011 (0.84)	0.003 (0.24)		0.002 (0.19)	0.012 (0.86)	0.003 (0.24)
distance school site-municipality (5-20 km)		-0.027* (-2.01)	-0.004 (-0.25)	-0.014 (-0.91)		-0.027* (-2.01)	-0.003 (-0.24)	-0.014 (-0.92)		-0.028* (-2.08)	-0.004 (-0.29)	-0.015 (-0.95)
distance school site-municipality (20-100 km)		-0.144*** (-8.64)	-0.121*** (-6.86)	-0.101*** (-5.42)		-0.143*** (-8.62)	-0.120*** (-6.81)	-0.101*** (-5.39)		-0.144*** (-8.68)	-0.121*** (-6.85)	-0.101*** (-5.41)
distance school site-municipality (>100 km)		-0.133** (-3.13)	-0.125** (-2.94)	-0.095* (-2.11)		-0.132** (-3.11)	-0.124** (-2.91)	-0.094* (-2.08)		-0.134** (-3.16)	-0.126** (-2.95)	-0.096* (-2.11)
Total per student spending in the ETC			0.000*** (3.74)			0.000*** (3.68)				0.000*** (3.77)		
% low-SES students in the ETC (5th grade) (2)			0.047 (0.61)			0.048 (0.62)				0.054 (0.70)		
total public enrollment ETC			-0.000*** (-5.78)			-0.000*** (-5.88)				-0.000*** (-5.79)		
Percentage of rural students in the ETC			0.039 (0.75)			0.039 (0.75)				0.038 (0.73)		
<b>Heterogeneous effects by availability of the next level</b>												
1 site: with upper secondary					0.114** (3.23)	-0.065 (-1.38)	-0.064 (-1.35)	-0.036 (-0.81)				
2-5 sites: no changes with integration (3)					0.104** (3.03)	-0.048 (-1.04)	-0.047 (-1.02)	-0.009 (-0.21)				
2-5 sites: integration make available upper secondary					0.114** (2.85)	-0.080 (-1.40)	-0.070 (-1.22)	-0.018 (-0.33)				
6 or more sites: no changes with integration					-0.039 (-1.13)	-0.104* (-2.24)	-0.107* (-2.32)	-0.036 (-0.80)				
6 or more sites: integration make available upper secondary					-0.070 (-1.83)	-0.084 (-1.59)	-0.077 (-1.47)	-0.005 (-0.09)				
<b>Heterogeneous effects by distance to the main site</b>												
2-5 sites & < 1km to principal site									0.012 (1.08)	0.013 (1.08)	0.012 (0.98)	0.024* (1.99)
2-5 sites & 2-5 km to principal site									-0.016 (-0.53)	0.010 (0.26)	0.018 (0.47)	0.054 (1.45)
2-5 sites & >5km to principal site									-0.158*** (-4.14)	-0.053 (-1.11)	-0.046 (-0.97)	-0.042 (-0.88)
6 or more sites & <1km to principal site									-0.119*** (-3.77)	-0.046** (-3.25)	-0.052*** (-3.60)	-0.005 (-0.32)
6 or more sites & 2-5 km to principal site									-0.187*** (-7.84)	-0.068 (-1.88)	-0.062 (-1.69)	-0.013 (-0.37)
6 or more sites & >5km to principal site									-0.202** (-10.54)	0.004 (0.14)	0.009 (0.27)	0.054 (1.67)
constant	0.592*** (61.42)	0.440*** (16.82)	0.302*** (5.36)	0.319*** (10.45)	0.492*** (14.56)	0.499*** (9.70)	0.359*** (4.92)	0.346*** (6.68)	0.592*** (61.40)	0.439*** (16.64)	0.294*** (5.17)	0.313*** (10.06)
Fixed effects ETC level	No	No	No	SI	No	No	SI	No	No	No	SI	No
N	8970	6782	6782	6782	8970	6782	6782	8970	6782	6782	6782	6782
r <sup>2</sup>	0.058	0.109	0.115	0.171	0.040	0.109	0.115	0.171	0.045	0.110	0.116	0.172
aic	7726.632	4777.013	4740.011	4478.556	7714.851	4778.890	4741.510	4481.832	7666.628	4775.935	4738.220	4475.258
bic	7747.937	4920.275	4910.562	5263.090	7757.460	4942.619	4932.527	5286.831	7716.339	4946.486	4936.059	5287.080

t statistics in parentheses  
\*p<0.05, \*\*p<0.01, \*\*\*p<0.001  
Notes:  
ETC: Certified Territorial Entity  
(1) The opposite of the traditional model is a flexible education model, which has specific educational materials and defined training processes. These models are designed to serve diverse populations, in situations of vulnerability and who have difficulty accessing the regular model. (e.g. Escuela Nueva, Post-Primaria, Telesecundaria).  
(2) low-SES student: student whose mother didn't complete secondary education (5th grade)  
The categories omitted are:  
(3) It includes sites with upper secondary and those not having upper secondary in the school  
The categories omitted are: 1 site; quintile 1 SES (9th grade); full-time school day; distance school site-municipality (< 1 km); 1 site: no upper secondary

Table 15. Main regression for existence of access to the internet in the site

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2-5 sites	0.097*** (8.38)	0.059*** (5.59)	0.022* (2.04)	0.004 (0.27)								
6 or more sites	-0.223*** (-21.54)	-0.034** (-2.87)	-0.060*** (-5.07)	-0.054*** (-3.42)								
total enrollment	0.000*** (11.28)	0.000*** (8.97)	0.000*** (9.01)		0.000*** (4.17)	0.000** (2.65)	0.000*** (3.97)		0.000*** (10.82)	0.000*** (8.12)	0.000*** (7.63)	
single-teacher	-0.230*** (-22.71)	-0.218*** (-21.48)	-0.201*** (-20.05)		-0.190*** (-17.67)	-0.184*** (-17.41)	-0.173*** (-16.63)		-0.217*** (-20.60)	-0.199*** (-18.88)	-0.180*** (-17.29)	
rural	-0.083*** (-5.29)	-0.065*** (-4.15)	-0.060*** (-3.88)		-0.116*** (-7.25)	-0.097*** (-6.07)	-0.090*** (-5.69)		-0.082*** (-5.25)	-0.064*** (-4.05)	-0.060*** (-3.87)	
quintile 2 SES (5th grade)	0.066*** (6.83)	0.067*** (6.94)	0.071*** (7.47)		0.062*** (6.37)	0.062*** (6.46)	0.066*** (7.02)		0.065*** (6.70)	0.065*** (6.73)	0.068*** (7.19)	
quintile 3 SES (5th grade)	0.097*** (8.73)	0.094*** (8.69)	0.100*** (9.36)		0.097*** (8.82)	0.094*** (8.70)	0.100*** (9.39)		0.096*** (8.72)	0.093*** (8.62)	0.099*** (9.27)	
quintile 4 SES (5th grade)	0.145*** (10.10)	0.130*** (9.29)	0.128*** (9.47)		0.154*** (10.76)	0.135*** (9.67)	0.134*** (9.89)		0.145*** (10.14)	0.129*** (9.22)	0.128*** (9.45)	
quintile 5 SES (5th grade)	0.187*** (10.94)	0.136*** (7.66)	0.122*** (6.96)		0.197*** (11.50)	0.139*** (7.85)	0.130*** (7.47)		0.190*** (11.08)	0.135*** (7.63)	0.123*** (7.00)	
% of students belonging to an ethnic group in primary	-0.052** (-3.10)	-0.023 (-1.31)	-0.062** (-3.13)		-0.050** (-2.95)	-0.020 (-1.14)	-0.053** (-2.62)		-0.057*** (-3.34)	-0.028 (-1.62)	-0.063** (-3.15)	
% of students who have repeated a course in primary	0.086 (1.37)	0.033 (0.54)	0.120* (2.25)		0.098 (1.60)	0.045 (0.75)	0.119* (2.24)		0.091 (1.46)	0.036 (0.60)	0.124* (2.34)	
years of operation	0.001*** (5.90)	0.001*** (5.81)	0.001*** (3.45)		0.001*** (5.70)	0.001*** (5.60)	0.001*** (3.36)		0.001*** (5.86)	0.001*** (5.77)	0.001*** (3.36)	
% of students in a traditional model of teaching (1)	0.019 (1.46)	0.006 (0.48)	0.054*** (4.36)		0.029* (2.27)	0.014 (1.13)	0.056*** (4.54)		0.017 (1.34)	0.002 (0.18)	0.048*** (3.89)	
double-shift	0.081*** (4.44)	0.060*** (3.39)	0.048** (2.58)		0.066*** (3.69)	0.043* (2.42)	0.034 (1.83)		0.073*** (3.98)	0.047** (2.60)	0.035 (1.90)	
only morning shift	-0.067*** (-4.69)	-0.027* (-2.08)	-0.037* (-2.44)		-0.066*** (-4.67)	-0.032* (-2.45)	-0.039** (-2.58)		-0.070*** (-4.89)	-0.031* (-2.37)	-0.038* (-2.51)	
other type of school day	0.052** (2.85)	0.076*** (4.44)	0.059*** (3.39)		0.026 (1.45)	0.047** (2.76)	0.035* (1.98)		0.042* (2.29)	0.061*** (3.57)	0.044* (2.55)	
distance school site-municipality (1-5 km)	0.036** (2.96)	-0.006 (-0.49)	0.008 (0.62)		0.036** (3.00)	-0.008 (-0.67)	0.004 (0.35)		0.050*** (4.01)	0.010 (0.80)	0.028* (2.16)	
distance school site-municipality (5-20 km)	0.036** (2.83)	-0.027* (-2.05)	-0.011 (-0.79)		0.034** (2.68)	-0.029* (-2.28)	-0.015 (-1.12)		0.050*** (3.79)	-0.011 (-0.80)	0.007 (0.54)	
distance school site-municipality (20-100 km)	-0.022 (-1.40)	-0.091*** (-5.68)	-0.058*** (-3.53)		-0.025 (-1.63)	-0.093*** (-5.86)	-0.060*** (-3.66)		-0.012 (-0.73)	-0.079*** (-4.85)	-0.046** (-2.71)	
distance school site-municipality (>100 km)	-0.070 (-1.47)	-0.087 (-1.78)	-0.041 (-0.86)		-0.079 (-1.76)	-0.096* (-2.06)	-0.049 (-1.07)		-0.075 (-1.55)	-0.096 (-1.89)	-0.049 (-1.01)	
Total per student spending in the ETC			-0.000*** (-12.87)				-0.000*** (-11.45)				-0.000*** (-13.21)	
% low-SES students in the ETC (5th grade) (2)			-0.233** (-2.71)				-0.286** (-3.21)				-0.282** (-3.25)	
total public enrollment ETC			0.000*** (9.38)				0.000*** (8.96)				0.000*** (9.54)	
Percentage of rural students in the ETC			-0.101 (-1.76)				-0.094 (-1.61)				-0.087 (-1.51)	
<b>Heterogeneous effects by availability of the next level</b>												
1 site: with lower secondary					0.620*** (43.27)	0.158*** (8.42)	0.103*** (5.19)	0.070* (2.54)				
2-5 sites: no changes with integration (3)					0.479*** (34.10)	0.176*** (10.11)	0.113*** (5.98)	0.079** (2.76)				
2-5 sites: integration make available lower secondary					0.339*** (25.37)	0.098*** (5.83)	0.033 (1.85)	0.012 (0.42)				
6 or more sites: no changes with integration					0.231*** (14.64)	0.147*** (7.98)	0.085*** (4.52)	0.073* (2.39)				
6 or more sites: integration make available lower secondary					0.016 (1.32)	-0.027 (-1.72)	-0.072*** (-4.41)	-0.067* (-2.28)				
<b>Heterogeneous effects by distance to the main site</b>												
2-5 sites & < 1km to principal site									0.237*** (20.25)	0.077*** (7.04)	0.045*** (4.01)	0.017 (1.28)
2-5 sites & 2-5 km to principal site									-0.030* (-1.97)	0.038* (2.39)	-0.011 (-0.67)	-0.053** (-2.91)
2-5 sites & >5km to principal site									-0.141*** (-8.60)	0.033 (1.70)	-0.019 (-0.95)	-0.053* (-2.47)
6 or more sites & <1km to principal site									-0.092*** (-6.73)	0.001 (0.08)	-0.015 (-1.15)	-0.021 (-1.28)
6 or more sites & 2-5 km to principal site									-0.239*** (-18.75)	-0.064*** (-4.09)	-0.100*** (-6.61)	-0.120*** (-6.33)
6 or more sites & >5km to principal site									-0.298*** (-26.16)	-0.060*** (-4.13)	-0.101*** (-6.96)	-0.111*** (-5.96)
constant	0.499*** (54.56)	0.490*** (19.05)	1.103*** (18.51)	0.727*** (23.61)	0.204*** (20.05)	0.449*** (16.08)	1.077*** (16.33)	0.706*** (17.89)	0.499*** (54.55)	0.483*** (18.73)	1.135*** (18.89)	0.742*** (23.95)
Fixed effects ETC level	No	No	No	Si	No	No	Si	No	No	No	Si	
N	37280	19629	19629	19629	37280	19629	19629	37280	19629	19629	19629	
r2	0.095	0.276	0.303	0.342	0.154	0.290	0.314	0.350	0.142	0.278	0.306	0.346
aic	47966.594	22071.371	21343.718	20385.985	45423.766	21690.808	21039.727	20155.700	45982.264	22029.096	21254.405	20271.094
bic	47992.173	22236.951	21540.837	21292.732	45474.924	21880.042	21260.500	21086.102	46041.947	22226.215	21483.063	21209.381

t statistics in parentheses

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001

Notes:

ETC: Certified Territorial Entity

(1) The opposite of the traditional model is a flexible education model, which has specific educational materials and defined training processes. These models are designed to serve diverse populations, in situations of vulnerability and who have difficulty accessing the regular model (e.g. Escuela Nueva, Post-Primaria, Telesecundaria).

(2) low-SES student: student whose mother didn't complete secondary education (5th grade)

The categories omitted are:

(3) It includes sites with lower secondary and those not having lower secondary in the school

The categories omitted are: 1 site; quintile 1 SES (5th grade); full-time school day; distance school site-municipality (< 1 km); 1 site: no lower secondary

Table 16. Main regression for existence of access to computer room in the site

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2-5 sites	-0.030** (-2.94)	-0.081*** (-8.17)	-0.063*** (-6.00)	-0.012 (-1.27)								
6 or more sites	-0.325*** (-30.84)	-0.162*** (-13.39)	-0.148*** (-12.05)	-0.079*** (-5.98)								
total enrollment		0.000*** (6.34)	0.000*** (6.12)	0.000*** (9.24)		0.000* (2.29)	0.000 (1.71)	0.000** (2.87)		0.000*** (4.96)	0.000*** (4.68)	0.000*** (7.41)
single-teacher		-0.204*** (-19.73)	-0.211*** (-20.66)	-0.210*** (-20.90)		-0.180*** (-16.59)	-0.185*** (-17.29)	-0.180*** (-17.16)		-0.173*** (-16.07)	-0.180*** (-16.95)	-0.179*** (-17.08)
rural		-0.013 (-1.01)	-0.023 (-1.66)	-0.025 (-1.82)		-0.048*** (-3.57)	-0.059*** (-4.16)	-0.063*** (-4.44)		-0.013 (-0.98)	-0.022 (-1.59)	-0.027 (-1.93)
quintile 2 SES (5th grade)		0.100*** (9.66)	0.100*** (9.63)	0.102*** (10.04)		0.100*** (9.73)	0.098*** (9.54)	0.098*** (9.72)		0.096*** (9.35)	0.096*** (9.29)	0.097*** (9.60)
quintile 3 SES (5th grade)		0.133*** (11.65)	0.132*** (11.70)	0.135*** (12.29)		0.140*** (12.37)	0.137*** (12.17)	0.138*** (12.55)		0.132*** (11.61)	0.131*** (11.56)	0.133*** (12.05)
quintile 4 SES (5th grade)		0.143*** (10.37)	0.145*** (10.32)	0.146*** (10.22)		0.159*** (11.55)	0.154*** (11.01)	0.153*** (10.83)		0.144*** (10.47)	0.143*** (10.19)	0.144*** (10.66)
quintile 5 SES (5th grade)		0.098*** (5.99)	0.098*** (5.38)	0.114*** (6.19)		0.128*** (7.90)	0.113*** (6.29)	0.127*** (6.96)		0.104*** (6.41)	0.098*** (5.35)	0.115*** (6.26)
% of students belonging to an ethnic group in primary		-0.120*** (-6.79)	-0.123*** (-6.77)	-0.125*** (-5.82)		-0.124*** (-6.96)	-0.125*** (-6.86)	-0.113*** (-5.27)		-0.131*** (-7.30)	-0.132*** (-7.17)	-0.126*** (-5.87)
% of students who have repeated a course in primary		-0.013 (-0.23)	0.005 (0.08)	0.022 (0.38)		-0.012 (-0.20)	0.004 (0.07)	0.020 (0.34)		-0.002 (-0.03)	0.011 (0.19)	0.029 (0.50)
years of operation		0.001*** (7.06)	0.001*** (6.90)	0.001*** (5.52)		0.001*** (6.49)	0.001*** (6.52)	0.001*** (5.29)		0.001*** (6.93)	0.001*** (6.80)	0.001*** (5.40)
% of students in a traditional model of teaching (1)		0.101*** (7.68)	0.104*** (7.96)	0.093*** (7.05)		0.110*** (8.42)	0.109*** (8.39)	0.098*** (7.44)		0.098*** (7.53)	0.098*** (7.63)	0.086*** (6.51)
double-shift		0.042** (2.59)	0.069*** (4.00)	0.075*** (3.90)		0.028 (1.70)	0.042* (2.43)	0.055** (2.83)		0.027 (1.66)	0.050** (2.90)	0.060** (3.14)
only morning shift		0.014 (0.91)	0.015 (0.91)	0.017 (0.90)		0.004 (0.25)	-0.001 (-0.08)	0.013 (0.67)		0.009 (0.57)	0.010 (0.62)	0.017 (0.88)
other type of school day		0.080*** (4.52)	0.087*** (4.80)	0.090*** (4.64)		0.058** (3.27)	0.054** (2.96)	0.061** (3.12)		0.058*** (3.30)	0.065*** (3.57)	0.070*** (3.61)
distance school site-municipality (1-5 km)		0.019 (1.44)	0.033* (2.37)	0.014 (1.02)		0.016 (1.27)	0.026 (1.85)	0.010 (0.70)		0.046*** (3.48)	0.055*** (3.95)	0.039** (2.68)
distance school site-municipality (5-20 km)		-0.016 (-1.10)	0.002 (0.10)	-0.011 (-0.69)		-0.015 (-1.02)	-0.003 (-0.17)	-0.015 (-0.98)		0.017 (1.19)	0.028 (1.81)	0.017 (1.04)
distance school site-municipality (20-100 km)		-0.112*** (-6.53)	-0.092*** (-5.12)	-0.078*** (-4.13)		-0.108*** (-6.34)	-0.093*** (-5.19)	-0.079*** (-4.21)		-0.083*** (-4.80)	-0.070*** (-3.83)	-0.054** (-2.85)
distance school site-municipality (>100 km)		-0.050 (-0.93)	-0.048 (-0.89)	0.047 (0.89)		-0.045 (-0.83)	-0.048 (-0.87)	0.040 (0.75)		-0.058 (-1.12)	-0.058 (-1.11)	0.038 (0.73)
Total per student spending in the ETC			0.000*** (6.25)				0.000*** (6.76)				0.000*** (5.70)	
% low-SES students in the ETC (5th grade) (2)			0.051 (0.58)				-0.115 (-1.27)				-0.017 (-0.20)	
total public enrollment ETC			0.000 (1.64)				0.000 (0.72)				0.000 (1.94)	
Percentage of rural students in the ETC			0.062 (1.02)				0.111 (1.80)				0.077 (1.29)	
<b>Heterogeneous effects by availability of the next level</b>												
1 site: with lower secondary					0.300*** (20.77)	-0.126*** (-7.13)	-0.106*** (-5.59)	-0.067** (-2.97)				
2-5 sites: no changes with integration (3)					0.205*** (13.54)	-0.102*** (-5.80)	-0.079*** (-4.10)	-0.038 (-1.69)				
2-5 sites: integration make available lower secondary					0.058*** (3.95)	-0.194*** (-11.17)	-0.173*** (-9.08)	-0.130*** (-5.86)				
6 or more sites: no changes with integration					-0.046** (-2.63)	-0.142*** (-7.31)	-0.117*** (-5.76)	-0.055* (-2.21)				
6 or more sites: integration make available lower secondary					-0.219*** (-14.94)	-0.270*** (-15.40)	-0.257*** (-13.74)	-0.213*** (-8.96)				
<b>Heterogeneous effects by distance to the main site</b>												
2-5 sites & < 1km to principal site									0.098*** (10.08)	-0.047*** (-4.96)	-0.035*** (-3.51)	-0.002 (-0.17)
2-5 sites & 2-5 km to principal site									-0.123*** (-8.83)	-0.107*** (-6.92)	-0.090*** (-5.65)	-0.059*** (-3.75)
2-5 sites & >5km to principal site									-0.279*** (-16.88)	-0.151*** (-7.80)	-0.133*** (-6.78)	-0.098*** (-5.06)
6 or more sites & <1km to principal site									-0.139*** (-10.01)	-0.079*** (-5.96)	-0.071*** (-5.32)	-0.021 (-1.54)
6 or more sites & 2-5 km to principal site									-0.314*** (-24.89)	-0.206*** (-12.82)	-0.194*** (-11.87)	-0.148*** (-8.62)
6 or more sites & >5km to principal site									-0.422*** (-35.89)	-0.242*** (-15.57)	-0.228*** (-14.40)	-0.180*** (-10.66)
constant	0.753*** (95.40)	0.697*** (27.19)	0.379*** (6.55)	0.592*** (21.15)	0.610*** (49.51)	0.794*** (27.52)	0.549*** (8.41)	0.692*** (20.41)	0.753*** (95.40)	0.679*** (26.77)	0.424*** (7.35)	0.610*** (21.79)
Fixed effects ETC level	No	No	No	SI	No	No	No	SI	No	No	No	SI
N	37280	19629	19629	19629	37280	19629	19629	19629	37280	19629	19629	19629
r2	0.084	0.235	0.240	0.259	0.109	0.247	0.252	0.271	0.140	0.246	0.250	0.269
aic	50689508.0	21611349.0	21490828.0	21164512.0	49631728.0	21320789.0	21190725.0	20849694.0	48340910.0	21337066.0	21240089.0	20913091.0
bic	50715086.0	21776929.0	21687947.0	22071260.0	49682885.0	21510024.0	21411498.0	21178009.0	48400593.0	21534185.0	21468747.0	21851378.0

t statistics in parentheses  
 \*p<0.05, \*\* p<0.01, \*\*\* p<0.001  
 Notes:  
 ETC: Certified Territorial Entity  
 (1) The opposite of the traditional model is a flexible education model, which has specific educational materials and defined training processes. These models are designed to serve diverse populations, in situations of vulnerability and who have difficulty accessing the regular model (e.g. Escuela Nueva, Post-Primaria, Telesecundaria).  
 (2) low-SES student: student whose mother didn't complete secondary education (5th grade)  
 The categories omitted are:  
 (3) It includes sites with lower secondary and those not having lower secondary in the school  
 The categories omitted are: 1 site; quintile 1 SES (5th grade); full-time school day; distance school site-municipality (< 1 km); 1 site: no lower secondary

## Appendix

Table A1. Comparison of the sample of sites used for the estimation in Table 3 (SABER 5 Language) ( $\geq 6$  students) with the unrestricted sample

Variable	Restricted ( $\geq 6$ students)	Unrestricted	Without controlling SES
	Mean	Mean	Mean
p_insuficientelenguaje_5_grado	18.0%	16.8%	18.6%
2-5 sites	56.1%	38.4%	54.8%
6 or more sites	33.6%	56.8%	36.4%
total enrollment	525	262	486
single-teacher	3.3%	42.2%	3.8%
rural	47.4%	74.8%	46.7%
quintile 2 SES (5th grade)	16.1%	24.4%	-
quintile 3 SES (5th grade)	24.9%	25.4%	-
quintile 4 SES (5th grade)	38.3%	23.5%	-
quintile 5 SES (5th grade)	11.9%	6.0%	-
% of students belonging to an ethnic group in primary	10.1%	8.7%	10.6%
% of students who have repeated a course in primary	2.9%	2.8%	2.9%
years of operation	31	28	30
% of students in a traditional model of teaching	77.2%	43.1%	76.5%
double-shift	41.7%	19.7%	40.2%
only morning shift	31.1%	43.2%	33.3%
other type of school day	16.3%	11.5%	15.7%
distance school site-municipality (1-5 km)	29.8%	27.7%	29.6%
distance school site-municipality (5-20 km)	37.5%	45.8%	36.9%
distance school site-municipality (20-100 km)	10.9%	13.4%	11.1%
distance school site-municipality (>100 km)	0.8%	0.6%	0.8%
Total per student spending in the ETC	2,926,843	2,999,635	2,926,128
% low-SES students in the ETC (5th grade) (2)	52.6%	56.8%	52.6%
total public enrollment ETC	197,875	197,716	198,769
Percentage of rural students in the ETC	34.0%	39.3%	34.1%
Number of sites	6,237	13,581	8,303

## References

- Abu-Ghaida, D.; Alonso, J.D., and Sánchez, A. (2011). Reforming Education Financing Systems in Transition Countries: An Introduction to Six Case Studies, in J.D. Alonso and A. Sánchez (eds.), *Reforming Education Finance in Transition Countries: Six Case Studies in Per capita Financing Schemes*. World Bank, Washington, DC. doi/abs/10.1596/978-0-8213-8783-2
- Ares Abalde, M. (2014). School Size Policies: A Literature Review. *OECD Education Working Papers*, No. 106, OECD Publishing, Paris. <https://doi.org/10.1787/5jxt472ddkjl-en>.
- Ayala, M.C. (2017). *Efecto de los docentes provisionales sobre desempeño académico: Evidencia para la educación secundaria oficial en Colombia*. Universidad de los Andes. Retrieved from: <http://2017.economicsofeducation.com/user/pdfsiones/159.pdf?PHPSESSID=so7ujho24h9n1v4iv2pn31fvo2>
- Bertoni, E.; Elacqua, G.; Jaimovich, A.; Rodriguez, J.; and Santos, H. (2018). Teacher Policies, Incentives, and Labor Markets in Chile, Colombia, and Peru: Implications for Equality. *IDB Working Paper Series* N° IDB-WP-00945. Available at <https://publications.iadb.org/en/teacher-policies-incentives-and-labor-markets-chile-colombia-and-peru-implications-equality>
- Brutti, Z.; and Sanchez, F. (2016). *New Teachers for Colombia: Is Quality Control Working?* Draft. Universidad de Los Andes. Retrieved from: [https://lacer.lacea.org/bitstream/handle/123456789/64418/lacea2016\\_new\\_teachers\\_colombia.pdf?sequence=1](https://lacer.lacea.org/bitstream/handle/123456789/64418/lacea2016_new_teachers_colombia.pdf?sequence=1)
- Chapman, C.; and Muijs, D. (2014). Does school-to-school collaboration promote school improvement? A study of the impact of school federations on student outcomes. *School Effectiveness and School Improvement*, 25(3), 351-393. DOI: 10.1080/09243453.2013.840319
- Chapman, C. (2015). From one school to many: Reflections on the impact and nature of school federations and chains in England. *Educational Management Administration and Leadership*, 43(1), 46-60. <https://doi.org/10.1177/1741143213494883>
- Corpoeducación. (2004). *La Nueva Institución Educativa: Orientaciones para su integración*.
- Econometría. (2013). *Estudio de los efectos de la fusión de establecimientos educativos en contextos rurales en cuatro entidades territoriales*. Retrieved from: [http://aprende.colombiaprende.edu.co/sites/default/files/naspublic/per/documentos/5.%20Estudio\\_Fusion\\_Sedes\\_final.pdf](http://aprende.colombiaprende.edu.co/sites/default/files/naspublic/per/documentos/5.%20Estudio_Fusion_Sedes_final.pdf)
- Elacqua, G.; Martínez, M.; Santos, H.; and Urbina, D. (2012). School closures in Chile. Access to quality alternatives in a school choice system. *Estudios de Economía*, 39(2), 179-202. <https://estudiosdeeconomia.uchile.cl/index.php/EDE/article/view/31042/43315>

- García, S.; Maldonado, D.; Perry, G. E.; Rodríguez, C.; and Saavedra, J. E. (2014). *Tras la excelencia docente: ¿Cómo mejorar la calidad de la educación para todos los colombianos?* Bogotá: Fundación Compartir. Retrieved from: <http://www.fundacioncompartir.org/pdf/Traslaexcelenciadocente18.02.2014.pdf>
- Giordano, E. (2008). *School clusters and teacher resource centres*. UNESCO International Institute for Educational Planning. Retrieved from: <http://unesdoc.unesco.org/images/0015/001597/159776e.pdf>
- Heckman J.J. (1978). Dummy endogenous variables in a simultaneous equations system. *Econometrica*, 46 (4), 931–960. DOI: 10.2307/1909757
- Instituto Colombiano para la Evaluación de la Educación. (2016). *Guía de Interpretación y Uso de Resultados de las pruebas Saber 3°, 5° y 9°*.
- Stiefel, L.; Schwartz, A.E.; Iatarola, P.; and Chellman, C.C. (2009). Mission matters: The cost of small high schools revisited. *Economics of Education Review*, 28 (5), 585-599. <https://doi.org/10.1016/j.econedurev.2009.01.005>
- Lee L.F. (1983). Generalized Econometric Models with Selectivity. *Econometrica*, 51, 507-512. DOI: 10.2307/1912003
- Ministerio de Educación Nacional (2005). *Guía No. 9 Guía Certificación de Municipios Menores de Cien Mil Habitantes*. Retrieved from: <https://www.mineduacion.gov.co/1759/w3-article-81012.html>
- Andrews, M.; Duncombe, W.; and Yinger, J. (2002). Revisiting economies of size in American education: are we any closer to a consensus? *Economics of Education Review*, 21 (3), 245-262. [https://doi.org/10.1016/S0272-7757\(01\)00006-1](https://doi.org/10.1016/S0272-7757(01)00006-1)
- Matthews, P.; Klaver, E.; Lannert, J.; Conluain, G.; and Ventura, A. (2009). *Policy Measures Implemented in the First Cycle of Compulsory Education in Portugal: International Evaluation for the Ministry of Education*. Office for Education Statistics and Planning, Ministry of Education, Portugal. Retrieved from: <http://www.oecd.org/education/school/42065538.pdf>
- Muijs, D. (2008). Widening opportunities? A case study of school to school collaboration in a rural district. *Improving Schools*, 11(1): 61–73. DOI: [https://doi.org/10.1007/978-94-007-0283-7\\_9](https://doi.org/10.1007/978-94-007-0283-7_9)
- Nitta, K.; Holley, M.; and Wrobel, S. (2010). A phenomenological study of rural school consolidation. *Journal of Research in Rural Education*, 25 (2), pp. 1-19. Retrieved from <http://sites.psu.edu/jrre/wp-content/uploads/sites/6347/2014/02/25-2.pdf>
- OECD. (2017). Organisation of the school offer. OECD Review of Policies to Improve the Effectiveness of Resource Use in Schools.
- Ome, A. (2013). El Estatuto de profesionalización docente: Una primera evaluación. *Cuadernos de Fedesarrollo*, 43. Retrieved from: <https://www.repository.fedesarrollo.org.co/handle/11445/156>

Sánchez, F.; Velasco, T.; Ayala, M.C.; and Pulido, X. (2016). Trayectorias de Permanencia, Deserción y Repitencia en la Educación Secundaria Colombiana y Sus Factores Asociados. *Documentos de Trabajo No. 36*. Available at <http://dx.doi.org/10.2139/ssrn.2927172>