

# EDUCATION GAP ANALYSIS

## THE EXECUTIVE SUMMARY



CASE STUDY APPROACH BY

**ABRE**  
PUERTO RICO



WALTON FAMILY  
FOUNDATION



One of the main unknowns of Puerto Rico's public education system is why some school units perform substantially better than others, even if they share a similar socioeconomic profile.

Over the years, ABRE has struggled to get accurate and normalized data on school units in Puerto Rico. Given such constraints, ABRE has managed to use the data from standardized tests to try to understand the performance of Puerto Rico's public schools. In March 2018, ABRE launched ABRE Tu Escuela ([abretuescuela.org](http://abretuescuela.org)), Puerto Rico's first citizen-driven initiative that provides a digital tool for evaluating the performance of individual public schools throughout the island. It includes detailed performance reports for over 1,200 schools, comparisons between these schools, school closure data and downloadable reports.

During 2019, ABRE decided to further its research towards discovering the underlying reasons for the discrepancies found in school performance among geographically proximate schools with similar enrollment and comparable poverty levels. This resulted in the research proposal titled Education Gap Analysis: A Case Study Approach. One of the main questions to be answered was: why do schools with similar characteristics and within close proximity to each other differ so much in their academic proficiency? Using proficiency data from [Abretuescuela.org](http://Abretuescuela.org) ABRE selected 14 schools that were to be analyzed in the proposed research. The sample was categorized in 7 pairs, each comprising one High Proficiency School (HPS) and one Low Proficiency School (LPS).

Since there was limited data available from the 14 selected schools and due to the exploratory nature of this research, ABRE designed 4 surveys to draw up a profile of the

schools, principals, teachers, and parents. The profiles were designed for gathering general descriptive information about the schools and to assess what could be impacting the schools' performance in the META-PR tests scores. In addition, a variety of organizational psychometric scales were used to scientifically measure different factors that could be affecting teachers and, consequently, affecting their performance within the school. In addition to the surveys, a semi-structured interview was designed for school principals. For the qualitative data analyses, ABRE

used the Grounded Theory approach and used it to draw general results and specific case conclusions. Many of the findings and conclusions are based on the qualitative data gathered through interviews, surveys, calls, visits and observations. The explanation for differences in school performance is inherently multivariate, and thus, identifying a set of unique factors will require multiple statistical controls which are outside the scope of the research. Yet, the case-

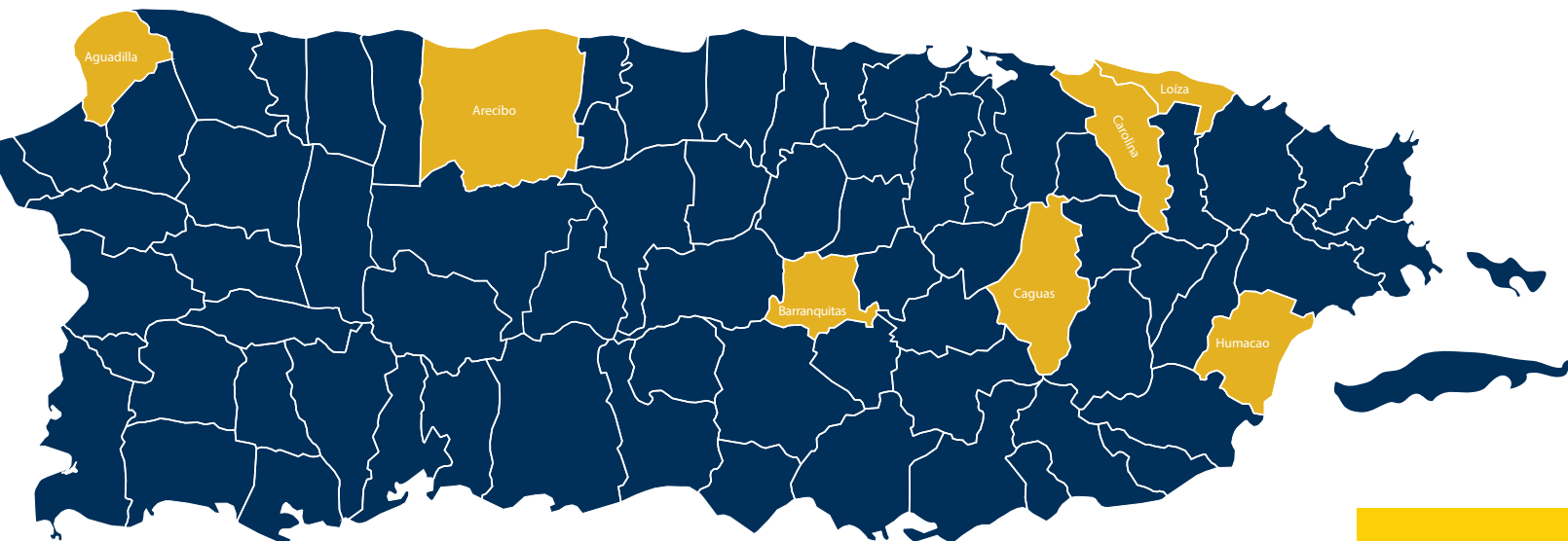
study approach provides concrete examples and direct field data of some of the main constraints and/or potential explanations to the large -unaccounted- gaps in school performance. A separate section was developed to analyze all 14 schools using aggregate empirical findings. These aggregate findings were developed in order to accurately present those variables and outcomes that are statistically significant for all schools within the selected sample. Although our results should not be extrapolated to the PRDE school system universally, they shed light into the intricacies of unequal school performance and the internal and external organizational structure that is currently influencing academic achievement.

## WHY DO SOME SCHOOLS PERFORM SUBSTANTIALLY BETTER THAN OTHERS WITH A SIMILAR SOCIOECONOMIC PROFILE?



Municipality and Sampled School	Average Proficiency Spanish	Average Proficiency Math	Average Proficiency English	Average Overall Proficiency
Aguadilla - HPS	83%	81%	82%	82%
Aguadilla - LPS	60%	67%	65%	64%
Arecibo - HPS	94%	90%	87%	90%
Arecibo - LPS	59%	58%	57%	58%
Barranquitas - HPS	96%	96%	96%	96%
Barranquitas - LPS	62%	58%	60%	60%
Caguas - HPS	78%	76%	77%	77%
Caguas - LPS	61%	59%	52%	57%
Carolina - HPS	63%	69%	68%	67%
Carolina - LPS	59%	60%	45%	55%
Humacao - HPS	80%	84%	85%	83%
Humacao - LPS	57%	62%	46%	55%
Loíza - HPS	71%	74%	74%	73%
Loíza - LPS	45%	54%	40%	46%

Exhibit A: Schools selected for case study



# Summary of Results

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Despite popular belief, differences in school performance are not intrinsically conditioned by socioeconomic conditions on the communities served by school units. Our research has shown that schools must be analyzed as independent units. Therefore, they should not be examined as a monolithic organization, but rather, a highly complicated structure that is constantly affected by external and internal factors. The case-study approach has shown that understanding what a high-performing school achieves could provide insights into what is required to improve a low-performing school.

## *Aggregate Inferential Statistics*

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### I. Schools Profiles

The School Profile Survey was answered by school principals. The survey had 67 short questions on the school's services, teachers and students' attendance rate, infrastructure, non-governmental alliances, federal programs, after-school programs, technologies, among others. After analyzing the results of the School Profile Survey, no single variable was identified that significantly predicted or affected the schools' META-PR scores proficiencies.

### II. Principal Profile

The survey of principals' profiles was filled by the incumbents of each school. The survey had 15 questions concerning the principal's academic background, work experience inside and outside of PRDE, teaching experience, among others. The analysis revealed the more years a principal spent working outside of the PRDE, the lower META-PR scores at the school. Surprisingly, the principals who have not worked as supervisors outside of the PRDE were the ones in schools with higher proficiency levels.

### III. Teacher Profile

The data for teachers' profiles was collected through an online survey of 30 questions. The survey had questions about academic backgrounds, certifications, years of teaching experience, courses given, other work experiences, among other questions. The number of year

There were also significant differences between teachers who take more than an hour to get to their school, compared to those who take less than

30 minutes and between 30 minutes to 1 hour. In the regression analysis, teacher education positively and significantly predicted school proficiency scores. This meant that a teacher's higher education level tends to predict higher proficiency META-PR scores. Also, the more years teachers spend in their school, the better the students' perform.

### IV. Parent Profile

The data for parents' profiles was collected through an online survey of 14 questions and 3 scales that were sent directly to the parents from the 14 selected schools. The survey incorporated 3 scales that ABRE developed for the research:

- The level of academic involvement a parent has with their children (e.g. with what frequency do they review their children's notebooks).
- The level of satisfaction a parent has with the school and its services (e.g. how do they feel about the teachers' work performance).
- The intention of abandoning the school and enrolling their children in a different school (e.g. they are currently considering other schools for their children).

The level of educational involvement correlated positively and significantly with all proficiencies, while satisfaction with the school correlated positively with educational involvement and negatively with the intention to change schools. In the regression analysis, the educational involvement of parents and the mothers' education level positively and significantly predicted the proficiency on the school's META-PR scores. Finally, parents who perceive that their children's education has not progressed in their school have a significantly higher intention of changing school.

### V. Psychometric Questionnaire

A second survey was sent to teachers to assess specific work-related factors that might be impacting their performance and, therefore, the schools' META-PR scores. This survey included different psychometric questionnaires that have been previously used and validated with the Puerto Rican workforce. The analysis revealed a significantly higher interactional justice level within LPS (perceptions that employees have about what is fair within the organization they work for). Also, teachers who understood that they do not have the necessary materials and equipment to do their job and do not feel safe at their workplace, were significantly more burned out than others. In the regression analysis,

distributive justice significantly predicted the proficiency on the school's META-PR scores, while intention to quit and interactional justice negatively predicted proficiency on META-PR scores.

### ABRE Scores Parental Immersion, Infrastructure Quality and Technology

ABRE collected a vast amount of data from the school unit, teachers, principals, and parents. To facilitate the interpretation of such data, ABRE developed a series of proprietary "scores" or indices that aggregated the results from all surveys and psychometric scales. The scores were categorized in the areas of academic proficiency, parental immersion, infrastructure quality and technology.

Municipality and School	Infrastructure Quality Score	Technological Infrastructure Score	Parental Immersion Score
Aguadilla HPS	67%	40%	93%
Aguadilla LPS	44%	40%	61%
Arecibo HPS	64%	47%	89%
Arecibo LPS	27%	14%	86%
Barranquitas HPS	64%	53%	75%
Barranquitas LPS	64%	47%	79%
Caguas HPS	36%	25%	82%
Caguas LPS	56%	33%	75%
Carolina HPS	75%	87%	86%
Carolina LPS	44%	40%	79%
Humacao HPS	64%	53%	75%
Humacao LPS	39%	33%	82%
Loíza HPS	n/a	n/a	86%
Loíza LPS	33%	40%	68%

**Exhibit B ABRE Scores**

As noted in the table, most pairs of schools show a consistent score in the indices, that is, HPS show higher scores than LPS. However, Barranquitas and Caguas show inconsistent results, as HPS and LPS show an inverse relationship or no significant variances. Such findings highlight the fact that even though infrastructure-related conditions are important, improving such conditions will not necessarily guarantee a higher academic performance. The research found that other programmatic characteristics could partially explain differences in school performance, those include problems associated with teachers and students' attendance, having Fine Arts programs, and federal programs and alliances with non-governmental organizations.

## Qualitative Analysis

ABRE conducted 12 semi-structured interviews to school principals of the sampled schools. Using a semi-structured interview guide, each school principal was asked about their experience and overall knowledge on: the school's accessibility to resources, factors that could potentially affect their students' performance, their outlook on the META-PR tests, among others. The results were studied and reviewed carefully using a discourse analysis technique.

Overall, the results show that schools, based on their principals' perception, are relatively similar in terms of the challenges they face and highly heterogeneous or unique with

respect to the strategies they have developed to influence the school's performance. Moreover, some school principals have shown a high level of proactivity and these usually fall within HPS.

An in-depth analysis was made to compare HPS principals' answers with those given by the LPS principals. We found three distinct significant aspects:

- Autonomy and strategies for the management and pursuit of funding opportunities and other resources.
  - The principals of the HPSs are aware that they have a limited budget and that there are usually hurdles to obtaining the resources that the school needs in a timely manner. Thus, they have developed different activities to find the resources or raise the funds needed. They seemed more proactive when looking for resources for the school. Among the strategies mentioned for finding school resources are: looking for support from the students' parents, applying for or requesting help from private organizations, and holding fund-raising activities.
  - Most of the principals of the LPSs rely on the ordinary budget assigned to their school by the PRDE (at the central level) to obtain the resources and materials they need, following the already established processes. The principals of the HPSs tend to look for more funding opportunities to fulfill the schools' unmet needs, as well as better management of the funds they can gather.
- Test preparation process for the META-PR standardized tests

- The HPSs tend to perform a more robust and structured test preparation process. This process usually starts at the beginning of the school year and includes actions such as organizing meetings with school staff and parents to raise awareness regarding the importance of these standardized tests. They use blueprints as guides to teach the necessary skills that will be measured in the tests. Likewise, they examine the areas where students scored the lowest to reinforce those areas' concepts or themes during the next school year. Some schools design a follow-up plan for those students who performed poorly on these tests.
- Some HPSs indicated that META-PR standardized tests correlate in a positive way with the results of the students' academic performance. Overall, they have a better perception of the utility and potential benefits of giving these tests.
- The test preparation process of the LPSs is more informal. They have meetings during the initial stages of the school year and emphasize the importance of these test from the 2nd semester onward. There is no process or protocol regarding potential adjustments in the curricula or plans that could be developed by teachers to improve test results. Most LPSs reported they take a week before the test to practice.
- Most of the principals of the LPSs have a negative perception of the META-PR standardized



tests. This perception is based on the tests' alleged inability to gauge students' academic performance and how they align with the school's prescribed curriculum. They also mentioned that the PRDE (at the central level) must develop strategies and tools to help schools improve their test results.

- Principals' levels of proactivity
  - Principals from HPSs showed higher levels of proactivity when answering questions during the interview. They had specific strategies in place to deal with teachers' level of absenteeism, get adequate and timely funding, and implement changes. Furthermore, when answering these questions, they were able to mention details of each subject and were able to provide specific examples of what they have implemented in their schools. They proved to be deeply knowledgeable on what goes on in their respective schools. Most of these principals had more years of experience working in their schools.
  - On the other hand, most (not all) of the LPSs principals answered many of these questions vaguely or with "politically correct" answers and were not able to provide detailed examples of implemented strategies that were currently in place. This could also be due to the fact that four of these principals were relatively new to their positions and have not had enough time to design and implement their own policies or strategies in order to assess their effects.

## Conclusions

ABRE's scores are not designed to determine the quality of a school principal, its teachers, and related personnel. As noted in our research, schools are complex systems that are constantly influenced by internal and external factors. Current rules and regulations have officially limited the autonomy that schools have and the actions they can take. Thus, school leaders that are highly proactive and willing to operate without the direct support of the PRDE tend to improve school performance. For instance, due to the socioeconomic challenges of students at the HPS of Aguadilla, the school has developed strategies and formal programs for

- preventing students from taking work home and providing classwork instead;
- establishing tutoring services within the school's business hours (making teachers available for the students);

- providing fine arts programs and sports so that students have things to do and learn after school; and
- constantly integrating parents in students' educational performance to present them with the necessary tools to help them improve

## School Principals: Agents of Change

School principals are key drivers for overall school performance, particularly when they operate their schools with a high degree of autonomy and are somewhat proactive. For instance, The HPSs tend to perform a more robust and structured test preparation process. Also, school principal from HPS had specific strategies in place to deal with teachers' level of absenteeism, get adequate and timely funding, and implement changes. The majority (83%) of school principals from HPS have more years in that position in their current schools and more years of experience being school principals under the PRDE overall. The more years a principal spent working outside of the PRDE, the lower META-PR scores were for said school. Thus, a potentially negative effect associated with work experiences that principals had outside of the PRDE system and that they could affect the academic performance of the schools in which they worked. **When this is combined with the fact that LPS principals have less time working in their schools, there is a clear tendency of higher turnover rates and a possible negative effect on the META-PR scores.**

- Principal turnover - On average, it may take 5 years since the installation of a new principal for a school to reach their previous performance or start showing improvement. As studies have shown, it is important to invest in high quality principals with long-term expectations for retaining their job in a particular school.
- Overall, the results show that schools, based on their principals' perception, are relatively similar in terms of the challenges they face and highly heterogeneous or unique with respect to the strategies they have developed to influence the school's performance. Moreover, some school principals have shown a high level of proactivity and these usually fall within HPS.
- School principals from HPSs asked for more autonomy to be able to effectively manage their budget, purchases, and their process of selecting or changing staff.

## Main Policy Recommendations

### I. Manage schools as individual (public) organizations and provide direct support mechanisms for school principals.

Our research shows that principals from the HPSs were knowledgeable on how to run the operational part of the school and felt empowered to be more proactive and solve problems systematically. However, most of these responses derived from the experience, creativity or initiative developed by school directors and the community which they oversee. As noted in this report, the HPSs consistently had a greater number of systems, processes, and amenities that complemented the typical academic curriculum. The traits of HPS consistently correlated with programs which fostered parental involvement, non-academic initiatives within the school, programs designed to reduce absenteeism, sound managerial policies from school directors, among others. Based on ABRE's findings, the PRDE should invest in mentorship or counseling programs that assist school principals and provide them with the necessary tools to manage their school unit. Such initiatives could take the form of: key alliances with non-governmental organizations, external funding opportunities, knowledge transfer mechanisms between schools in a relatively close geographic area, robust operational systems (technologically-driven) to alleviate non-academic tasks, among others. A well-documented and easily executable tool is a yearly needs assessment which is performed before each semester. Such tool could capitalize on standardize research instruments, such as the ones used to gather data along this report. The assessment must involve all key stakeholders of the school unit: teachers, parents, principals and supporting personnel.

### II. Increase school principals' autonomy over resources allocated to the school.

One of the main findings of this study is that no matter how similar they might be on paper, each school operates as an independent unit, as a sort of small island. As is the case with any other organization, schools are affected by internal and external variables that could define their performance. Unless they have control over those defining variables, there is very little they can do to change their circumstances. The fact that some schools perform better than others, even with a lackluster infrastructure -along with other data- evidenced that proactive school principals

have managed to create coping mechanisms to "informally" meet those pressing needs. The research showed that school principals require greater autonomy in the areas of human resources, budget, and procurement. By enabling pilot projects in these areas, PRDE could start measuring the effects of such devolving measures and potentially reduce employee rotation and turnover, which the research found highly correlated with school performance.

### III. Develop mentor programs for school principals and create a vice-principal or assistant principal position in every school.

PRDE should consider designing a Pilot Mentorship Program in which, for instance, more experienced principals can collaborate with less experienced ones. This mentoring would promote or enable the transfer of knowledge associated with management strategies and overall best practices in the school setting. An already established example of a mentorship leadership program is The School Leaders Collaborative. This public-private collaborative network is dedicated to building the capabilities of school leaders and their communities through the sharing of learning experiences that will improve academic outcomes for all students in Puerto Rico.

Moreover, public policy should be established to create a new position for school vice-principals or assistant principals. If such policy is created, new school principal candidates could be required to have 2-3 years of experience as a vice-principal or assistant principal (in addition to other qualifications). A vice-principal or assistant principal provides support wherever needed. Sometimes assistant principals are assigned to work with more administrative or operational tasks, while the school principal supervises the academic program.

### IV. Foster the development of strategic alliances.

ABRE's findings suggest that there are substantial gains for schools that are able to create alliances with non-governmental organizations and acquire funding grants to meet their specific needs. In such cases, the Regional Offices for Education (OREs) can serve as facilitators for these sorts of programs, so that schools can benefit from all the available services they could be eligible for. As shown in our study, these alliances do not have to be solely in the economical or budget needs, apart from grants, there are different organizations that are willing to invest their resources or develop initiatives that cover the different needs that each school has.



## V. Give a higher priority to META tests.

This study demonstrates the need for educating principals, teachers, parents, and students on the implications of these tests. Some principals do not consider the META-PR test important or valid and, therefore, do not invest their efforts on strategies for improving student test performance.

A detailed META-PR Readiness Guide should be drafted and shared by the Assessment Unit at PRDE's central level. Such a tool would guide principals and teachers from the beginning of the semester (August) on the required steps to guarantee students are well prepared to take the META-PR tests. To accelerate the adoption of these measures, compliance could be incentivized via additional funding appropriations, uniform rules for government-wide test taking conditions (i.e. a specific day for all schools in a region), among others.

## VI. Operationalize data-driven tools within school units.

Most of the findings outlined in this report have a common denominator, typically grounded on the lack of well-executed tools or automated mechanisms that could measure the performance of all the actors, systems and processes which condition school performance. The fact that ABRE had to deploy tertiary data gathering tools, for information which should be readily available at the school level, denotes the inability of the public school system to adequately monitor performance. The use of data in the daily operations of schools should not be limited to compliance or reporting requirements from the PRDE, but rather it should be conceived as a readily available mechanism for agile decision-making and locally-based insights. By enabling data-driven tools, the success and failures of strategies developed at the school level, could be shared with other units to adjust their programs and strategies. These efforts must be at the local level as to foster the engagement of the community and to recognize the needs of each school.

## Further Research

Additional research is required to analyze the factors that are impacting the schools' academic proficiency. The current research was limited to a set of 14 schools distributed around the island. Consequently, the research instruments developed for this study could be used for a larger and statistically-representative sample size. Increasing the sample size could provide additional insights and substantially reduce statistical errors. Moreover, the PRDE could internally replicate this research and use the surveys as program evaluation tools or instruments to gather basic data that is currently unavailable at the department.

Per our results, there is a strong need to perform further research regarding the role of the school principal. This exercise is not merely academic, but rather practical and with robust public policy implications since small improvements in the managerial structure of a school could render long-lasting benefits to its entire community. Moreover, previous research has focused on teachers and other components of the school system, but with limited visibility on the individuals (principals) who are responsible for the performance of the entire school.

ABRE Puerto Rico will continue to pursue research initiatives which are able to gauge sound policy interventions given the dynamics of Puerto Rico's educational institutions. To that end, this report will serve as the enabling blocks or foundational data for analyzing the health and wellbeing of school principals in the Island. Several key characteristics associated with school principals will be considered: organizational needs, health needs and competency needs.

At ABRE we are starting an investigation on the variables that are empirically associated with the "well-being" of directors in terms of their organizational structure, their physical health and their competence.

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