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A Local Regulatory Strategy for Basic Education in Rio de Janeiro

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ABSTRACT – A Local Regulatory Strategy for Basic Education in Rio de Janeiro. This paper explores data about the performance of municipal schools in Rio de Janeiro during the first years of basic education to show that the regulatory instruments currently employed by the federal government must be complemented by a strategy that focus on local factors. Using data about the geographical location of Rio de Janeiro municipal schools and their performance at IDEB, we were able to pick out neighboring schools that achieved diametrically opposed results, despite serving students with comparable socioeconomic status. This reality suggests that bottom-up regulatory instruments might be employed efficiently. There is, however, a normative gap in that regard, with a strong prevalence of top-down public policies currently in place.
Keywords: Basic education. Bottom-up regulation. School Administration.

RESUMO – Uma Estratégia Regulatória Local para a Educação Básica no Rio de Janeiro. Este artigo explora dados referentes ao desempenho das escolas municipais do Rio de Janeiro nos primeiros anos do Ensino Fundamental para apurar que medidas podem ser utilizadas para complementar os instrumentos regulatórios *top down* voltados para a educação, evidenciando que fatores locais exercem influência expressiva sobre a qualidade do ensino. Na cidade, escolas vizinhas apresentam resultados diametralmente opostos, apesar de serem comparáveis em termos socioeconômicos. Essa realidade sugere que instrumentos regulatórios *bottom-up* podem ser usados de maneira eficiente. Há, porém, uma lacuna normativa nesse sentido, com a forte prevalência de políticas públicas *top-down*.
Palavras-chave: **Educação Básica. Regulação bottom-up. Gestão Escolar.**

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Introduction

There is broad political and social consensus in Brazil regarding the importance of public basic education[1]. The repeated references to it in the Brazilian Constitution, as well as the requirement that a given percentage of each federative agent's budget should go towards education, established by art. 212 of the Constitution[2], are proof of that. The political decision to constitutionally protect public basic education was the result of a mobilization of civil society during the drafting of the 1988 Constitution, the likes of which leaves no doubt about its centrality to Brazilian public life (Martins, 2018).

Recent civil society initiatives, such as the movements: All for Education[3] and the Education Map[4], show that the commitment of Brazilians to the Basic Education agenda has not waned over the 30 years that separate us from the constitutional convention. This commitment continued to be strengthened in an institutional manner by the edition of the National Education Guidelines and Bases Law - LDB 9394/96, the National Curricular Guidelines - DCNs, 2013, the National Education Plans of 2010 and 2014 - PNEs, among other documents and regulations of national scope.

The specific choices made by representatives responsible for the 1988 Constitution are also informative with respect to another important aspect of our argument. They are symptomatic of the kind of attention that the law, through its regulatory instruments, has given to education: there is a focus on *top-down*[5] instruments, such as funding programs and federal resource transfers (such as for school meals, school transportation and textbooks), the definition of a national curriculum, teacher training programs, among others. To a large extent, this focus was an effective strategy to improve the initial phase of Basic Education - the initial years of Elementary School - in a significant way: since the beginning of the measurement of IDEB[6], there has been significant progress in the performance of Brazilian schools in the initial years of Elementary School[7], demonstrating that public policies in the valorization and measurement of basic education (Coelho, 2008) were, at least in part, successful.

This result makes sense, as the specialized literature indicates that factors such as school infrastructure (Alves; Soares, 2013b), the socioeconomic level of students (Alves; Soares, 2007a), among other social and demographic variables (Andrade; Laros, 2007), exert a significant influence on IDEB scores. In any case, much remains to be done: despite the adoption of the policies mentioned in the last PISA[8], the country's performance fell short of what was desirable (for an analysis of the poor results in the previous evaluation, see Sassaki et al., 2018).

Given the current scenario of economic crisis and the advances that have already been made through *top-down* policies, it seems useful to seek different and complementary strategies for public basic education. Factors at school level related to management, pedagogical practices, autonomy (Bloom et al, 2015) and integration with the community

(Cunha et al, 2017) have a significant influence on student performance. Therefore, public management and, in particular, the regulation of education, must adopt strategies that are complementary to the centralizing regulatory instruments that have characterized advances in education in recent years.

The need for a broader range of regulatory strategies also arises from the multiplicity of situations that make up the problem of education in Brazil, since there are different stages of development not only between states, but also between cities and, even more so, between schools that make up the education network of the same city. It is reasonable to think that a certain degree of infrastructure (including access to meals, school transportation and structural conditions such as libraries, laboratories and other technological structures), a training plan for teachers, the supply of teaching materials and the existence of a minimally adequate curriculum are necessary conditions for schools to achieve better results. After a certain point, however, these instruments have less impact on learning outcomes, which is why the opportunity cost of different possible regulatory strategies should be taken into consideration in order to optimize the process of improving learning indicators.

To demonstrate the usefulness of complementary strategies to the regulatory instruments already being used by the Brazilian Federal Government, this article will analyze the following hypotheses: (i) Schools in the same municipal school network (in other words, schools from the same city) show relevant IDEB differences; (ii) regulatory instruments based on a *bottom-up* strategy could be used in a complementary way to the policies already implemented to improve the learning outcomes of students.

The city of Rio de Janeiro will be used as a test case for the above hypotheses. This article will use georeferenced data from the city[9] on the performance of municipal schools in IDEB[10], with specific target aiming at the early years of elementary school (Elementary I). These data make it possible to check whether there are neighboring - and therefore comparable - schools with very discrepant results. The information collected by the INEP[11] and the Rio de Janeiro City Hall's Department of Education also allows for testing whether any differences between school pairs can be reduced to socio-economic factors, as measured by the Indicator of the Socioeconomic Level of Basic Education - INSE[12] and the limits of favelas.

The physical proximity of discrepant school pairs, if detected, is indicative that at least some of the challenges linked to improving the quality of Basic Education need to be addressed with regulatory instruments complementary to the federal measures mentioned, in particular using the *bottom-up* approach. After all, if it is proven that some schools achieve good results (or relevant developments in the indicators) despite the difficulties they face, their practices can serve as an example to inform recovery measures for other school units that perform worse. Learning lessons from local experiences is what characterizes *bottom-*

up regulatory strategies, and the best way to implement them remains to be seen (whether through help from the Federal Government or through a change in the regulatory governance of cities in order to incorporate programs and/or *bottom-up* regulatory measures into their portfolio).

The choice of the initial years of elementary school is justified by its probable impact on the later stages (final years of elementary school and high school). The hypothesis is that the deficiencies in teaching in the early years of elementary school impair what needs to be learned by students in the final years and generate serious consequences in the development of the student during high school[13]. The statistics are consistent with this hypothesis. When looking at math learning alone, for example, only 42.9% of students leave the initial years of Elementary School (Ensino Fundamnetal I) with an adequate level of learning. This number drops to 18.2% at the end of Ensino Fundamental II and 7.3% at the end of High School[14] (Todos pela educação, 2018). The same story is repeated for the performance of students in Portuguese, with similar data.

Presumably, students who left the early years of primary school with insufficient ability in the core subjects of the curriculum - Portuguese language and mathematics - have greater difficulty in learning, which can generate not only a cascading effect on student performance over time, with possible impacts on school dropout, due to its effect on the age/student year ratio. If this reasoning has any merit, the most efficient way of allocating resources is sequential, confronting first the deficits that present themselves in the initial years of elementary school and, later, in their final years. The choice of the City of Rio de Janeiro as the target of the investigation was more pragmatic: the city stands out as a reference center in open data (Schreiner, 2016, p. 26).

Differences in Learning Outcomes in the Same School Network: possibility of a bottom-up approach

There are strong indications that *bottom-up* regulatory strategies can represent significant advances in the quality of learning: the "Excellence with equity" research project (Faria; Guimarães, 2015, Lemann Foundation; Itaú BBA, 2012), which aimed to identify and investigate some reference schools in different regions of Brazil with quantitative and qualitative methods pointed to the importance of qualified principals and good management practices at the school level, drawing attention to peculiarities of teaching that are difficult to regulate through centralizing instruments. Quantitatively, these efforts make a difference: Bloom *et al* (2015), in a study that investigated eight countries, including Brazil, showed the high degree of influence exerted by school management practices - in particular, their degree of administrative autonomy - over the academic performance of their students.

Taking into account what has been said above regarding the impact of specific management measures, the need for complementary regulatory instruments makes sense if: (I) there are municipal schools

with discrepant IDEB scores in the early years of elementary school and (II) these schools are physically and socioeconomically close. Using data from the Department of Education of the Rio de Janeiro City Hall (PCRJ, 2019) and microdata from IDEB (2019), it was possible to explore these variables, creating a heat map where each point represents a school in the municipal education network and the color temperature represents the school's IDEB score. The warmer the color (the closer to black), the smaller the school's IDEB score.

Figure 1 – IDEB in Basic Education - Elementary School - Initial Years - of Rio de Janeiro's Municipal Schools[15]
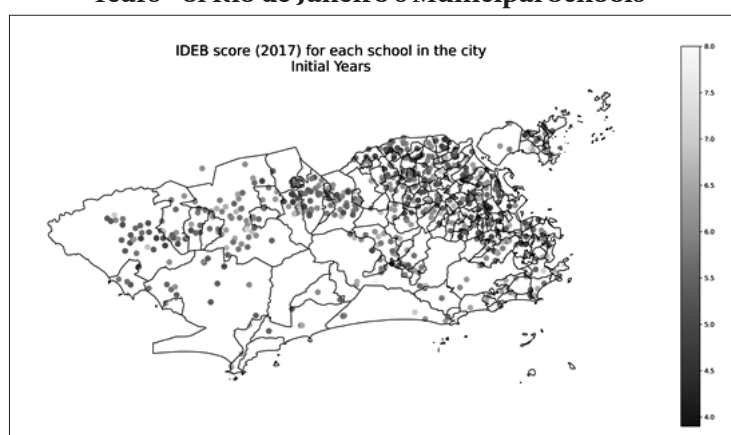
Source: authors, based on data from IDEB (2017) and Rio de Janeiro City Hall (PCRJ, 2019).

Figure 1 shows that both assumptions seem plausible. In a manner consistent with the specialized literature regarding the factors that influence school performance (Alves; Soares, 2007a, Alves; Soares, 2013b; Andrade; Laros, 2007; Gramani, 2017), some areas of the city have a higher concentration of schools with low performance, corroborating already known hypotheses about the weight of socioeconomic issues in the learning outcomes of children and young people. However, in practically all districts of the city of Rio de Janeiro, it is possible to observe much lighter (orange) points (higher IDEB scores) alongside darker (black) points (lower IDEB scores), indicating that in fact there are neighboring schools with substantially different performance.

On the existence of Reference Schools and Underperforming Schools in the School Network of the City of Rio de Janeiro - RJ

Which schools can be considered a reference in this context? If the goal is to find the variables at the school level that can be manipulated to make schools with poor performance reach an acceptable level of quality, we should ideally identify the schools that have gone through this history. Thus, instead of focusing solely and exclusively on school performance in the last IDEB assessment - 2017 – we decided to select the schools that showed an expressive evolution in IDEB scores between

the measurements of 2005 and 2017. Two different categories were created for the reference schools: 1) Schools that went from very bad performance to good performance: in this first classification are the schools that had IDEB scores below 4 in the 2005 assessment and reached IDEB scores above 6 in the 2017 assessment (24 schools); 2) Schools that went from bad performance to good performance: similarly to the first category, schools that had IDEB scores below 5 in the 2005 assessment and IDEB scores above 6 in 2017 (124 schools) were included in this group.

The other side of the problem also demands a narrow definition (i.e. what criterion would serve to identify underperforming schools). With this in mind, underperforming schools were defined as those that simultaneously fulfilled two conditions in the city of Rio de Janeiro: 1) Schools which occupied the last quartile of IDEB scores in the 2017 evaluation (159 schools); and 2) Schools which occupied the last quartile of the average for each school of the last 4 IDEB measurements (2011, 2013, 2015 and 2017) - 135 schools.

Either criterion, applied in isolation, would be potentially misleading. The first because, while it may capture which schools are performing worse at the moment, it may also include traditionally excellent schools that, because of some merely conjectural reason, performed poorly in the 2017 IDEB. The second criterion could leave out schools that showed some improvement in the last IDEB, even though they had difficulties in the first evaluations of our timeframe.

The joint application of the criteria identified 103 schools that need to be assisted through state policies. After the exclusion of two schools with incomplete data[16], a universe of 101 schools remained in this category (underperforming schools, recipients of aid).

Figure 2 represents, for each underperforming school, the closest reference school, allowing a visualization of their geographical positions:

Figure 2 – Underperforming schools and reference schools
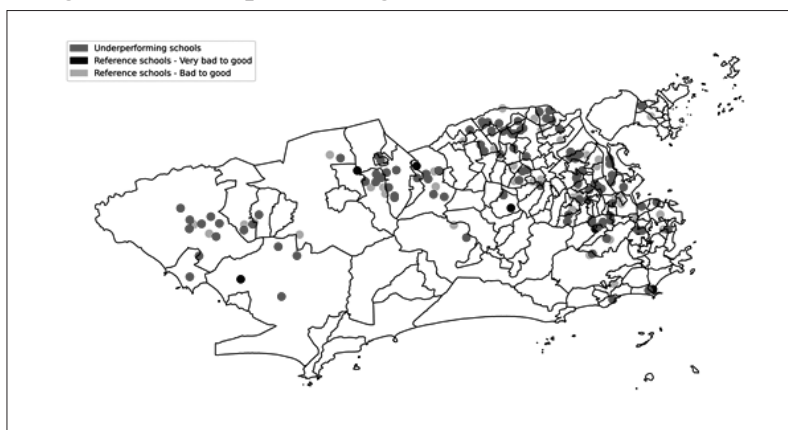
Source: the authors, based on data from IDEB (2005-2017) and Rio de Janeiro City Hall (PCRJ, 2019).

Figure 2 shows the existence of reference schools alongside underperforming schools[17]. In the most emblematic cases for performance comparison purposes, the nearest reference school is only a few hundred meters from the underperforming school (see Table 1).

In a few cases, the distance between the underperforming school and the reference school is large (see Table 2), but these distances may still not represent relevant comparative challenges for the two schools.

Table 1 – 10 shorter distances between schools

Underperforming school	Reference School	Distance (meters)
CIEP THOMAS JEFFERSON[18]	LIMA BARRETO MUNICIPAL SCHOOL	98.083
ALBINO SOUZA CRUZ MUNICIPAL SCHOOL	EMA NEGRAO DE LIMA MUNICIPAL SCHOOL	103.77
JENNY GOMES MUNICIPAL SCHOOL	PEREIRA PASSOS MUNICIPAL SCHOOL	246.9
MUNICIPAL SCHOOL RUBENS BERARDO	MUNICIPAL SCHOOL PROFESSOR AFONSO VARZEA	253.62
CIEP DOCTOR NELSON HUNGARY	MUNICIPAL SCHOOL PROFESSOR JOAO GUALBE...	297.48
MUNICIPAL SCHOOL ARAUJO PORTO ALEGRE	MARIO FACCINI MUNICIPAL SCHOOL	369.22
MUNICIPAL SCHOOL PRESIDENT E JOAO GOULART	PANAMA MUNICIPAL SCHOOL	425.55
MUNICIPAL SCHOOL SOARES PEREIRA	MUNICIPAL SCHOOL BARAO DE ITACURUSSA	428.06
CIEP COLONEL SARMENTO	EURICO VILLELA MUNICIPAL SCHOOL	448.42
MEM DE SA MUNICIPAL SCHOOL	PEREIRA PASSOS MUNICIPAL SCHOOL	469.14

Source: Own elaboration, based on data from IDEB (2005-2017) and Rio de Janeiro City Hall (PCRJ, 2019).

Table 2 – 10 longer distances between schools

Underperforming school	Reference School	Distance (meters)
CIEP DEPUTY ULYSSES GUIMARAES	MUNICIPAL SCHOOL TEACHER MARIA SANT...	5685.05
MUNICIPAL SCHOOL TEACHER CASTILHO	MUNICIPAL SCHOOL TEACHING LEOCADIA T...	5333.84
CIEP VILA KENNEDY	SAMUEL WAINER MUNICIPAL SCHOOL	3075.76
JOANA ANGELICA MUNICIPAL SCHOOL	SAMUEL WAINER MUNICIPAL SCHOOL	3058.39

MUNICIPAL SCHOOL DRIVER PASCHOAL ANDRE	MANUEL DE ABREU MUNICIPAL SCHOOL	3014.43
CIEP ANTONIO CANDEIA FILHO	ISAIAS ALVES MUNICIPAL SCHOOL	2993.62
JULIO CESARIO DE MELO MUNICIPAL SCHOOL	MUNICIPAL SCHOOL TEACHER MARIA SANT...	2944.2
ALZIRO ZARUR MUNICIPAL SCHOOL	MANUEL DE ABREU MUNICIPAL SCHOOL	2943.04
MUNICIPAL SCHOOL PADRE JOSE MAURICIO	RAYMUNDO CORREA MUNICIPAL SCHOOL	2939.46
GENERAL MUNICIPAL SCHOOL OSORIO	ISAIAS ALVES MUNICIPAL SCHOOL	2789.42

Source: The authors, based on data from IDEB (2005-2017) and Rio de Janeiro City Hall (PCRJ, 2019).

Thus, it is possible to observe that the data supports the hypotheses raised at the beginning of the paper. It was possible to notice that schools within the municipal network of Rio de Janeiro present disparate academic results and that these differences are reproduced even in geographically close pairs. Finally, we found that the distance between reference schools and underperforming schools is often quite small and that, even in the most dramatic cases, we found reference schools at a reasonable distance from each underperforming school.

Difference in Performance Correlated to Socioeconomic Factors

The motivation for selecting the closest school pairs was the assumption that geographically nearby schools are similar in relation to the *top-down* variables (i.e., they are eligible for the same funding programs, are subject to the exact same curriculum, have the same career plan and training-level for teachers, among others). In addition, district-level HDI and GDP, for example, are likely to remain constant for neighboring schools since, as can be seen from Table 1, these schools are usually in the same neighborhood or in immediately neighboring neighborhoods. On the other hand, one of the most important variables for school performance, the socioeconomic level of students, may vary among neighboring schools, which could explain the difference in results among the pairs of schools identified, despite their physical proximity (as a function of the difference among students). Therefore, an important question arises here: can the differences between reference and underperforming schools be explained by this factor?

We used data from INSE (INEP, 2015b)[19] to test this hypothesis. Although there is a correlation between INSE and IDEB for the 149 schools evaluated at this stage of the study[20], the result does not replicate for school pairs. When looking only at the distance between the INSE of the reference school and the underperforming school and the difference in IDEB performance between the school pair, there is no correlation[21], as can be seen in Figure 3.

This result can be interpreted as follows: although certain regions have a higher concentration of school-references and there is an influence of INSE on absolute IDEB scores for the neighborhood, the physical proximity of school pairs implies a proximity in the student body, so that the variation among pairs cannot be explained only with reference to the socioeconomic level of students.

Figure 3 – Correlation between IDEB (2017) and INSE (2015) differences for each closer school pair[22]
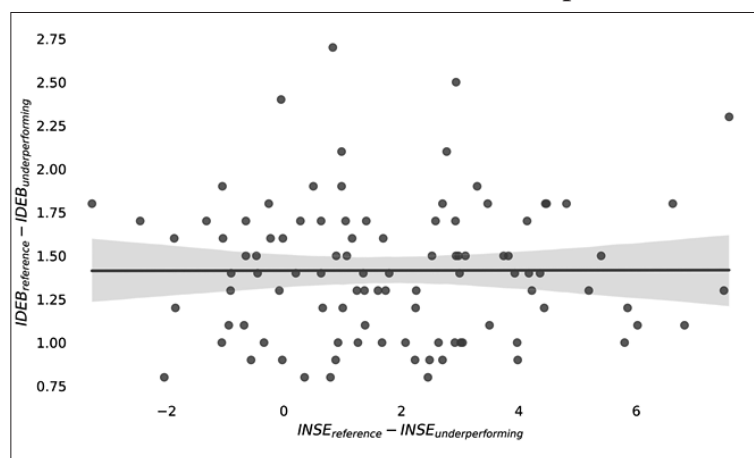
Source: IDEB (2017); INSE (2015).

From the data presented in Figure 3, it can be seen that: (i) There is a high number of underperforming schools in the city of Rio de Janeiro; (ii) For most of these schools, there is a reference school at a reasonable distance that can serve as an example (for the design of management practices that worked in a comparable context).

As we will argue in the next few pages, this information is extremely relevant for the regulation and improvement of municipal education. Moreover, socioeconomic variations among students in each school pair have not been able to explain the difference in performance of these students, which is suggestive of the effectiveness of local management practices implemented in the reference schools[23].

Regulatory Solutions and Principal/Agent Problem: Efficiency of Local Regulatory Instruments

Since 2007, the Ministry of Education (Ministério da Educação e Cultura - MEC) has created a series of instruments with the objective of encouraging and assisting local educational policies, both at State and Municipal levels[24]. In particular, a series of actions were developed under the Education Development Plan (Plano de Desenvolvimento da Educação - PDE), with the objective of fulfilling the All for Education

Commitment goal plan, incorporated into Brazilian law by the Decree 6.094/2007, to which all Brazilian municipalities adhered (or at least the majority, see Souza; Alcântara; Vasconcelos, 2014, p. 225). The main decentralized form of incentive for the development of education under the PDE is the possibility for cities of making agreements with Federal and State governments involving federal funds and technical assistance.

In order to adhere to the PDE and become eligible for the financial and technical transfers, each city had to analyze, in light of the criteria established by the MEC, the performance of its own education and, based on this diagnosis, prepare an Articulated Action Plan (Plano de Ações Articuladas - PAR), which serves as a guideline for the celebration of eventual agreements (Souza; Alcântara; Vasconcelos, 2014; Oliveira, 2014, p. 413). In practice, the informatics system in which cities must register their diagnosis automatically suggests the actions that must be implemented by the Department of Education based on the answers provided to the evaluation items[25]. Although formal adherence to the PAR has been high, particularly in the State of Rio de Janeiro, the diagnostic step is subverted by perverse incentives. Souza, Alcântara and Vasconcelos (2014), for example, published the research paper "Local Diagnostics of the articulated action plan: an analysis of its reliability" in which they explore the contradiction between the IDEB score of the State of Rio de Janeiro in 2011 – one of the 5 worst in Brazil – and the positive evaluation that the cities made in the PAR diagnosis.

According to the authors cited, the reasons for these discrepancies may be linked to the asymmetry of information combined with discrepant interests:

> [...] because, by attributing higher scores [the cities] find themselves free from the description of the actions that the PAR system thinks should be adopted, [in addition to avoiding] [...] greater regulation by federal government policies (since, in the case of unsatisfactory evaluations, the municipality has to face up to the consequences stipulated in the plan) (Souza; Alcântara; Vasconcelos, 2014, p. 228).

Thus, on a number of significant occasions, the PAR does not seem to meet its decentralizing objectives[26]. This becomes clear when one notices that the automatic coupling of actions to diagnosis causes the perverse incentives described above to have practical consequences.

From the perspective of the economic analysis of law, the problems faced in implementing PAR appear to be principal-agent problems (Melo, 1996), in which the interests of the public (principal) are not achieved by those responsible for city level education (Municipal Departments of Education and, ultimately, school principals). As this is an information problem, there is a need to build local regulatory instruments to increase transparency and *accountability*[27] on the measures needed to repair underperformance in the schools identified[28]. And because of the principal-agent problem, compounded by possible additional costs associated with political arrangements (mayors and gov-

ernors may be from distinct political parties, and may still be politically opposed to the holders of office in the federal government), federal solutions are likely to be unable to effectively eliminate the performance gap.

It seems, therefore, that the creation of local regulatory governance responsible for reparatory actions is the most efficient way to complement the *top-down* approach, which has effectively improved results over the past 15 years. To reverse the underperformance of the identified schools, it is necessary to look at a series of factors specific to each of the units, including the conduct of school principals and the way they relate to teachers (Bloom et al., 2015, Lemann Foundation; Itaú BBA, 2012); the conduct of members of state regulatory bodies and their contact with principals and, finally, the relationship between the parents of students and the school (Cunha et al., 2017; Coelho, 2008).

Decentralizing policies have been adopted in several countries, with positive results (see Bloom et al, 2015). Examples of this international trend for valuing *bottom-up* strategies can be found in the United Kingdom, with the academies program – academies are basic education institutions, completely independent of public authorities (Eyles; Machin, 2018) - and in Portugal, where administrative decentralization of the public network is indicated as one of the reasons for the country's improved performance on PISA (Liebowitz et al., 2015). Even the US, which had a controversial decentralizing experience with the *No Child Left Behind* program, still signals towards the valorization of local policies, for example, by returning the regulation of incentives linked to performance evaluations to Sates as a solution to their educational problems (Sharp, 2016).

The largest success story in Brazil, widely used as an example in the literature, is that of the city of Sobral, in Ceará, which went from an IDEB score of 4.0 in the initial years of elementary school in 2005 to a score of 9.1 in 2017 (Gramani, 2017; Menezes Filho, 2015; Inep, 2005a). Since 2001 (Inep, 2005a), the aforementioned city has adopted management strategies that seek to eradicate illiteracy and school evasion by valuing teachers, establishing performance-based bonuses and awards, and measuring the results every six months with the aid of an external commission. The State of Ceará as a whole has stood out in Basic Education as a result of strategies similar to those employed in Sobral, which emphasize the local character of education, although there is still considerable room for improvement (Gramani, 2017, Abrucio; Seggatto; Pereira, 2018).

In Rio de Janeiro, however, there is no regulatory instrument that organizes reparatory actions for underperforming schools, bringing transparency to necessary actions, learning outcome targets and even incentives or sanctions in the event of non-compliance. There are important provisions regarding Basic Education in the Municipal Organic Law (the relevant city-level statute), which, after repeating many of the provisions already present in the federal Constitution, delegates the specific regulation of the subject to the Municipal Education Plan

(lano Municipal de Educação - PME) which, however, does not provide a regulatory instrument that is capable of guiding a *bottom-up* strategy. In particular, large cities, such as the City of Rio de Janeiro, with a very large number of schools[29], need regulatory governance that allows greater transparency for each of their schools, as well as for the planning of individualized actions focused on underperforming schools, which will only be possible with empirical evaluations such as the one presented in the first section of this paper.

The latest version of the PME in Rio de Janeiro was approved by Law 6.362/2018. Structured by means of sets of goals and strategies, the PME establishes concrete objectives regarding the expansion of access and quality of Basic Education, including target scores in IDEB and PISA. However, there is no provision for specific reparatory actions[30], which need to relate directly to the existing discrepancies between schools in the municipal education network, although there are local strategies to address the learning problem[31]. There is also no sign of publicly funded research to identify practices that make certain schools, principals and teachers stand out from the rest. Adopting PME-based programs as they stand today may not be enough to address the difficulties presented by underperforming schools, as they do not allow for the individualized actions typical of a *bottom-up* approach to implementing public policies, nor do they encourage strategies that prioritize more effective results in the quality of learning, such as a reparatory focus in the early years of elementary school.

Conclusion

The analysis of the educational data of the City of Rio de Janeiro showed that there are neighboring schools with disparate performances in standardized tests. There are pairs of schools with underperforming and reference schools less than one kilometer apart. In addition, socio-economic differences among students in these schools cannot explain the difference in their performance. However, currently the set of regulatory instruments used to address reparatory actions is insufficient, either because of the principal-agent problems in accessing federal regulatory instruments or because of the absence of regulatory mechanisms at the level of the City of Rio de Janeiro in this direction.

In general, there is an opportunity for the implementation of decentralizing regulatory policies, which complement *top-down* strategies with *bottom-up* ones. Finding a regulatory solution for education in the city of Rio de Janeiro therefore requires detailed consideration of local characteristics. The present work, lacking a qualitative empirical step, limited as it is to the quantitative identification of school pairs that serve as confirmation for the need of a *bottom-up* strategy, is not sufficient to find a solution. It would be inherently contradictory to preach the importance of local variables and go on to outline a solution for Rio de Janeiro solely based on the strategies that worked, for example, in the UK. However, it is already possible to advance some conclusions.

The first is the one resulting from the empirical analysis carried out in this paper: it is necessary to develop *bottom-up* regulatory instruments for the city of Rio de Janeiro. To the extent that local variables not associated with socioeconomic factors matter significantly for school performance, the need to develop regulatory instruments that exert local influence and are capable of inducing the behavior of agents seems obvious. The relative lack of regulation at the municipal level - observed in the case of the city of Rio de Janeiro - is not justifiable in view of the convergence of empirical and conceptual evidence around the importance of school management. The improvement in data requires an improvement in public management (Ragazzo, 2011).

Moreover, given the good outcomes of *top-down* policies, it seems reasonable that the focus of local regulatory instruments should be on reversing the trend on the worst performing schools. The idea that public education should be offered with equity finds a lot of support in literature (Faria; Guimarães, 2015, Lemann Foundation; Itaú BBA, 2012, Comunitas; Juntos pelo Desenvolvimento Sustentável; FGV Ebape, 2017, Coelho, 2008). Social justice require that the focus of state efforts should be in underperforming schools, especially for the first years of elementary school, since that learning at this stage will have impacts on the later stages of students' education.

The existence of reference schools throughout the city of Rio de Janeiro shows that it is possible to overcome the financial, administrative and structural limitations that afflict public education and to achieve good results, which suggests that *bottom-up* strategies can represent a complementary approach in order to understand how reference schools' management practices within their geographical area can shorten the path to identifying the solution to repair the results of underperforming schools.

The results of the analyses carried out in the research also make clear that these solutions have to be designed by local agents, due to the principal/agent problem that arises from situations in which the aid depends on access to the Federal Government, which, by the way, already occurs through the PAR and which, until now, has not proved sufficient to revert the situation identified in the City of Rio de Janeiro, which has over 100 underperforming schools.

The task carried out in this article justifies the struggle to maintain and improve instruments such as IDEB and the School Census, because only with reliable and consistent data sets will it be possible to adequately evaluate education. This data enables the development of a local regulatory governance capable of creating additional regulatory instruments for the monitoring of school performances (with purposes and periodicity distinct from federal assessment instruments), repair and aid, providing greater transparency and *accountability* for government actions addressed at the educational deficits of Brazilian cities.

Finally, it is important to point out that Rio de Janeiro (as well as Brazil) has already demonstrated through concrete examples that it is

capable of high quality education, since the municipal school with the best performance in elementary school has an IDEB score of 8.0[32]. Therefore, it is possible to achieve excellence. The difficulty is to extend this knowledge to schools with low performance, generating scale by learning the management techniques that have a positive impact on IDEB scores. New regulatory instruments, such as the one suggested in this paper based on the identification of pairs of reference and underperforming schools for the dissemination of best practices, can be applied to cities with profiles similar to that of Rio de Janeiro, thus maximizing results, minimizing costs and improving indicators, but with different impacts on municipal schools, demanding individualized reparatory actions for a relevant number of units on a given educational network.

Notes

1 Basic Education - according to Art. 21 of LDB 9394/96, Basic Education is comprised of three levels: Kindergarten, Elementary and High School, and should serve children and young people from 0 to 16 years of age.

2 Although a movement has recently emerged to untie the budget at the federal level, including spending on health and education. Available at: https://brasil.elpais.com/brasil/2019/01/02/politica/1546459750_824035.html. Access on: Jun. 20, 2019.

3 According to its website, the All for Education Movement is "a non-governmental organization, without links to political parties, but one that dialogues with everyone, and that has never received resources from the government. Our daily routine is to produce studies and research, mobilize society for the improvement of the quality of Education and to articulate with public authorities educational policies that guarantee learning for all children and young people". https://www.todospelaeducacao.org.br/. Visited on 03/06/2020.

4 The organization's website announces that the Education Map is "a movement of young people who believe that quality education for all is possible. Effective public education policies and a civil society that is increasingly engaged in this discussion are the key to this!" https://mapaeducacao.com/. Visited on: 03/06/2020.

5 This article adopts the typology in the terms and with the meaning indicated by Pülzl; Treib (2007, p. 90). According to the authors, *top-down* strategies "place their main emphasis on the ability of decision makers' to produce unequivocal policy objectives and on controlling the implementation stage". In contrast, *bottom-up* strategies "view local bureaucrats as the main actors in policy delivery and conceive of implementation as negotiation processes within networks of implementers" (2007, p. 90). The consensus identified by the authors regarding the distinction is that it is a continuum: policies can be more or less *top-down* or *bottom- up*, depending on the degree of autonomy they give to "local bureaucrats" (p. 100).

6 IDEB is a standardized education assessment metric that takes into consideration two factors: 1) the academic performance of students in Prova Brasil and 2) the approval rates of each school. According to the presentation of

the document that introduced the instrument (Fernandes, 2007), signed by Oroslinda Goulart, this option is justified: " the evident complementarity between the two is assumed, remembering that even if students achieve high scores on standardized exams, an educational system that systematically fails its students, causing the abandonment of a significant number of them, without completing basic education, is not desirable" (p. 5). One of IDEB's outstanding features is the possibility that two schools achieve the same grade through different combinations of grades in Prova Brasil and pass rate.

7 In 2007, the national IDEB score for the initial years of elementary school was 4.2, having reached a score of 5.8 in 2017.

8 According to INEP, "The International Student Assessment Programme (Pisa), [...] is an international comparative study, conducted every three years by the Organization for Economic Cooperation and Development (OECD). [...]. Brazil has participated in Pisa since the beginning of the evaluation". http://portal. inep.gov.br/pisa. Visited on: 03/06/2020. In the last evaluation, in 2018, Brazil performed worse than neighboring countries such as Uruguay and Chile, although it improved upon the results of the previous evaluation, from 2015.

9 Available at: http://hub.arcgis.com/datasets/PCRJ::escolas-municipais. Visited on: 13/05/2019.

10 We use all available data, including in different analyses the IDEBs of 2005, 2007, 2009, 2011, 2013, 2015 and 2017.

11 INEP- Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira, a federal agency whose mission is "to subsidize the formulation of educational policies of the different levels of government in order to contribute to the economic and social development of the country". http://portal.inep.gov.br/web/guest/sobre-o- inep/institucional. Visited on: 03/06/2020.

12 The INSE (Indicator of Socioeconomic Level of Basic Education) is a metric that aims to capture socioeconomic differences among students in public basic education schools (See Inep, 2015b).

13 In this sense: "[...] literacy is the basis of successful schooling and influences the reduction of age distortion and dropout rates [...]" (Inep, 2005a, p. 15).

14 The modest increase in the IDEB for Secondary Education of the national public network from 3.1 in 2007 to 3.5 in 2017 is consistent with our hypothesis. After all, it is precisely the forecast that increases in the initial years of elementary school will allow for increases in elementary school's final years.

15 The following analyses consider the school's IDEB as a dependent variable. A criticism raised against this strategy points to the possibility that schools may reach the same IDEB through different results, since the IDEB is calculated from the grade in SAEB/Prova Brasil, combined with the approval rate. Since this is the case, at least some of the pairs we identified could represent a similar performance in the test, with differences only in approval rates. This criticism is valid. Analyses considering directly the school's score in the SAEB – the standardized test -, however, show that there are still pairs of neighboring schools with discrepant performances. There is overlap between the pairs identified using IDEB or SAEB, but there is also divergence. This, however, is less important than the persistence of the working hypotheses, since there is no pretension, at least not yet, to indicate exactly which specific school paris should be prioritized by public policy, but only to show the convenience of a *bottom- up* perspective.

16 They are the municipal schools Mario Lago, in Santa Cruz and Raphael Almeida Magalhães, in Bangu.

17 The State of Ceará, according to Abrucio; Seggatto; Pereira (2018) established a regime of administered competition between the cities. According to the authors "it is a model in which the government establishes controlled mechanisms of competition, aiming at increasing the performance of public bodies, public services and territorial entities. In this situation, indicators are constructed to measure results, and resources (financial and managerial) are generally distributed according to the performance of the participants. The aim is also to create incentives to motivate the worst performers and support mechanisms for them, often including the need for the 'best' to help the 'worst'" (p. 39). This is exactly in the spirit of our school pairs analysis: once identified, we can make the 'best' help the 'worst'.

18 A large part of the CIEPs - a program historically associated with the State government of Rio de Janeiro

- has been municipalized over the past few years. See Cavaliere; Coelho (2013), for a retrospective.

19 We did not find the INSE data concerning the Mario Faccini municipal school, which is why we excluded it from the analysis.

20 $R = 0.43$, $p < 0.001$.

21 $R = 0.002$, $p = 0.98$.

22 On the X-axis, the differences in the socio-economic level between each of the members of the school pairs identified are represented. On the Y axis is the IDEB difference between the benchmark school and the underperforming school. The absence of a pattern indicates that we cannot reduce the differences observed in the IDEB to the socioeconomic conditions of the students in the schools.

23 Another possibility that deserves to be explored is that schools perform differently according to their insertion in communities at risk. To verify if the difference between school pairs could be explained by this factor, data from Rio de Janeiro's City Hall on favela boundaries was used (available at: http://www.data.rio/datasets/limite- favelas). Access on: 12 Jun. 2019). Only 3 out of 101 underperforming schools are within the limits described by the municipality. Even when we expand the area of favelas by 20%, only 19 under performing schools are within the established perimeter. Therefore, even if these units were eliminated from our comparison, there would still be 82 pairs of reference schools and underperforming schools whose difference could not be reduced to socioeconomic factors of some nature. We chose to keep these 19 schools in the main analysis for some reasons. First, because if there is a willingness to promote equity, it is especially important to look at the schools that most need help. Secondly, it would be necessary to explore which territorial factors dissociated from the socioeconomic conditions of the student body could adequately explain possible differences between schools that are within and outside the limits of the favelas. Although this difference was perceived when controlling for the effects of the INSE, it was decided not to explore explanatory hypotheses on this occasion.

24 Here, it is important to note a distinction between *bottom-up* strategies and local strategies. By determining centrally what types of problems and solutions can be found by municipalities, we understand that PARs are a local but

top-down instrument. What matters in defining whether a policy is *bottom-up* or *top-down* is the centralization of decision making and the relative lack of flexibility found by the implementers at the tip, rather than its scope.

25 For details of actions, see Ministry of Education, 2011a; for a step-by-step on the PAR generation procedure. (Ministry of Education, 2011b).

26 For a detained analysis of the Campos dos Goytacazes case, see Paula (2017).

27 *Accountability* is a term used to denote the need for managers to be accountable for their attitudes. This is the sense in which we invoke the term and in which it has been used in the education debate in Brazil. See Abrucio (2010, p. 269).

28 In Brazil, PL 7,420/2006, entitled Educational Responsibility Law, tried to regulate local incentives involved in education in a broad way. The project provided for the evaluation of student performance with the establishment that results should always be better than those of the previous year; targets for progressive improvement with regard to repetition and dropout rates, and the obligation to draw up an education plan. Failure to comply with these measures, in turn, would affect voluntary transfers from the Union and could even lead to crimes of responsibility or acts of administrative improbity. The draft Law on Educational Responsibility in fact manipulates variables that matter for the solution of the problem. Education plans decrease the asymmetry of information in the relations between society and educational managers, while the establishment of performance *standards* in terms of test performance and dropout and repetition rates decrease the asymmetry of information regarding the results of the educational process. In any case, the project is still in progress and has not been incorporated into the Brazilian legal system.

29 Just to put it in context, Sobral's strategy may not be replicable in the city of Rio de Janeiro since these are totally different orders of magnitude. According to the 2018 School Census, Sobral has 14,543 students enrolled in the early years of elementary school, compared to 404,008 students in the city of Rio de Janeiro. The information was extracted from the Qedu platform (www.qedu.org.br), fed with data from the 2018 School Census. The socio-demographic and cultural conditions of the two cities are also quite different.

30 PL 7,420/2006 created an incentive model based on sanctions, recognizing the importance of the local character of problems involving education. Failure to meet the targets set by schools would generate an obligation on the part of the Federation Units to "develop specific actions, with the necessary allocation of financial resources, compatible with the needs to overcome the causes that are determining the shortcomings observed [...]" (art. 2, § 4). The understanding that 1) any underperforming situation needs to be addressed and 2) this addressing must take place at the local level is fundamental to understanding the type of regulatory instrument that is appropriate. On the other hand, the model based on sanctions may be inadequate to generate positive results, since it is necessary to create a prior minimum regulatory structure to assess the responsibility of the manager, which does not exist in the largest number of municipalities that exist in Brazil today.

31 For example, strategy 19.5, which aims to: "encourage the participation and consultation of education professionals, students and their families in the formulation of political-pedagogical projects, school curricula, school management plans and school regulations, ensuring the participation of parents in the evaluation of teachers and school managers".

32 This is the Municipal School Teacher Didia Machado Fortes, located in Barra da Tijuca.

References

ABRUCIO, Fernando Luiz; SEGGATTO, Catarina Ianni; PEREIRA, Maria Cecília Gomes. **Regime de Colaboração no Ceará**: funcionamento, causas do sucesso e alternativas de disseminação do modelo. São Paulo: Instituto Natura, 2018. Disponível em: <http://www.institutonatura.org.br/wp-content/uploads/2018/10/Pesquisa-FGV-_PAIC.pdf>. Acesso em: 12 jun. 2019.

ALVES, Maria Teresa; SOARES, José Francisco. As Pesquisas Sobre o Efeito das Escolas: contribuições metodológicas para a sociologia da educação. **Sociedade e Estado**, Brasília, v. 22, n. 2, p. 435-473, maio/ago. 2007a.

ALVES, Maria Teresa; SOARES, José Francisco. Contexto Escolar e Indicadores Educacionais: condições desiguais para a efetivação de uma política de avaliação educacional. **Educação e Pesquisa**, São Paulo, v. 39, n. 1, p. 177-194, jan./mar. 2013b.

ANDRADE, Josemberg Moura; LAROS, Jacob Arie. Fatores Associados ao Desempenho Escolar: estudo multinível com dados do SAEB/2001. **Psicologia**: teoria e pesquisa, Brasília, v. 23, n. 1, p. 33-41, jan./mar. 2007.

BLOOM, Nicholas; LEMOS, Renata; SADUN, Raffaella; VAN REENEN, John. Does Management Matter in Schools? **The Economic Journal**, n. 125, p. 647-674, maio 2015.

CAVALIERE, Ana Maria; COELHO, Lígia Martha. Trajetória dos CIEPs do Rio de Janeiro: municipalização e novas configurações. **Educação em Foco**, Juiz de Fora, v. 18, n. 2, jul./out. 2013, p. 213-242.

COELHO, Maria Inês de Matos. Vinte Anos de Avaliação da Educação Básica no Brasil: aprendizagens e desafios. **Ensaio**: avaliação e políticas públicas em educação, Rio de Janeiro, v. 16, n. 59, p. 229-258, abr./jun. 2008.

COMUNITAS; JUNTOS PELO DESENVOLVIMENTO SUSTENTÁVEL; FGV EBAPE. **Como Melhorar o Ideb**: experiências que funcionam. 2017. Disponível em: <https://wiki.redejuntos.org.br/system/files/2017-10/cartilhaeducacaoweb-2_0.pdf>. Acesso em: 15 maio 2019.

CUNHA, Nina; LICHAND, Guilherme; MADEIRA, Ricardo; BETTINGER, Eric. **What Is It About Communicating with Parents?** Stanford: Stanford, 2017. Disponível em: <https://cepa.stanford.edu/sites/default/files/cunha_cover_paper1.pdf>. Acesso em: 02 mai. 2019.

EYLES, Andrew; MACHIN, Stephen. The Introduction of Academy Schools to England's Education. **Journal of the European Economic Association**, v. 17, n. 4, ago. 2019, p. 1107-1146.

FARIA, Ernesto Martins; GUIMARÃES, Raquel Rangel de Meireles. Excelência com Equidade: fatores escolares para o sucesso educacional em circunstâncias desfavoráveis. **Estudos em Avaliação Educacional**, v. 26, n. 61, jan./abr. 2015, p. 192-215.

FERNANDES, Reynaldo. **Índice de Desenvolvimento da Educação Básica (Ideb)**. Brasília: Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira, 2007.

FUNDAÇÃO LEMANN; ITAÚ BBA. **Excelência com Equidade**: as escolas que oferecem um ensino de qualidade aos alunos com baixo nível socioeconômico,

2012. Disponível em: <https://fundacaolemann.org.br/materiais/excelencia-com-equidade>. Acesso em: 02 mai. 2019.

GRAMANI, Maria Cristina. Análise dos Determinantes de Eficiência Educacional do Estado do Ceará. **Ensaio**: avaliação e políticas públicas em educação, Rio de Janeiro, v. 25, n. 95, abr./jun. 2017, p. 507-526.

INEP. **Vencendo o Desafio da Aprendizagem nas Séries Iniciais**: a experiência de Sobral/CE. Brasília: INEP, 2005a. Disponível em: <http://portal.inep.gov.br/documents/186968/488938/Vencendo+o+desafio+da+aprendizagem+nas+s%C3%A9ries+iniciais+a+experi%C3%AAncia+de+Sobral-CE/a7de6174-3f52-49fe-b81c-9f40372761a3?version=1.0>. Acesso em: 08 maio 2019.

INEP. **Nota Técnica – Indicador de Nível Socioeconômico das Escolas de Educação Básica (Inse)**. Brasília: INEP, 2015b. Disponível em: <http://download.inep.gov.br/informacoes_estatisticas/indicadores_educacionais/2015/nota_tecnica/nota_tecnica_inep_inse_2015.pdf>. Acesso em: 11 jun. 2019.

INEP. **IDEB – Resultados**. Brasília: INEP, 2020. Disponível em: <http://portal.inep.gov.br/web/guest/educacao-basica/ideb/resultados>. Acesso em 13 jul. 2020.

LIEBOWITZ, David; GONZÁLEZ, Pablo; HOOGE, Edith; LIMA, Gonçalo. **OECD Reviews of School Resources**: Portugal, 2018. OECD Publishing: Paris, 2018.

MARTINS, Paulo de Sena. Constituinte, Financiamento e Direito à Educação: a voz dos protagonistas. **Educação & Sociedade**, Campinas, v. 39, n. 145, out./dez. 2018, p. 823-845.

MELO, Marcos André. Governance e Reforma do Estado: o paradigma agente x principal. **Revista do Serviço Público**, Brasília, v. 120, n. 1, jan./abr. 1996, p. 67-82.

MENEZES FILHO, Naercio. Como Melhor a Educação no Brasil? **Revista Interesse Nacional**, v. 31, out./dez. 2015. Disponível em: <http://interessenacional.com.br/2015/10/05/como-melhorar-a-educacao-no-brasil/>. Acesso em: 08 maio 2019.

MINISTÉRIO DA EDUCAÇÃO. **Plano de Ações Articuladas – PAR 2011-2014**. Guia Prático de Ações para Municípios. Brasília: MEC, 2011a. Disponível em: <http://portal.mec.gov.br/index.php?option=com_docman&view=download&alias=9435-guia-pratico-acoes-par2011-2014-nov&category_slug=novembro-2011-pdf&Itemid=30192>. Acesso em: 17 jun. 2019.

MINISTÉRIO DA EDUCAÇÃO. **Orientações para Elaboração do Plano de Ações Articuladas (PAR) dos Municípios (2011-2014)**. Brasília: MEC, 2011b. Disponível em: <http://portal.mec.gov.br/index.php?option=com_docman&view=download&alias=9400-manualelaboracao-par-municipal-1114-pdf&category_slug=novembro-2011-pdf&Itemid=30192>. Acesso em: 17 jun. 2019.

OLIVEIRA, Adailda Gomes de. Políticas Educacionais e a Qualidade da Educação nos Municípios Fluminenses: alguns recortes. **Ensaio**: Avaliação e Políticas Públicas em Educação, Rio de Janeiro, v. 22, n. 83, p. 411-442, abr./jun. 2014.

PAULA, Otávio Cordeiro de. **O Plano de Desenvolvimento da Escola como Instrumento de Gestão das Escolas Públicas Municipais de Campos dos Goytacazes-RJ**. 2017. 193f. Tese (Doutorado em Educação) – Departamento de Educação, PUC-Rio, Rio de Janeiro, 2017.

PREFEITURA DA CIDADE DO RIO DE JANEIRO – PCRJ. Dados sobre Escolas Municipais. Rio de Janeiro. Disponível em: <http://hub.arcgis.com/datasets/

PCRJ::escolas-municipais>. Acesso em: 13 maio 2019.

PÜLZL, Helga; TREIB, Oliver. Implementing Public Policy. 2007. In: FISCHER, Frank; MILLER, Gerald, SIDNEY, Mara. (Org.). **Handbook of Public Policy Analysis**: theory, politics and methods. Boca Raton: CRC Press, 2007. P. 89-107.

SASSAKI, Alex Hayato; DI PETRA, Giovanni; MENEZES FILHO, Naercio; KOMATSU, Bruno. **Por Que o Brasil Vai Mal no PISA?** uma análise dos determinantes do desempenho no exame. Insper. PolicyPaper, n. 31, jun. 2018. Disponível em: <https://www.insper.edu.br/wp-content/uploads/2018/08/Por-que-Brasil-vai-mal-PISA-Analise-Determinantes-Desempenho.pdf>. Acesso em: 16 maio 2019.

SCHREINER, Clara. **International Case Studies of Smart Cities**: Rio de Janeiro, Brazil. Inter-American Development Bank, Discussion Paper n. IDB-DP-447, 2016. Disponível em: <https://publications.iadb.org/en/international-case-studies-smart-cities-rio-de-janeiro-brazil>. Acesso em: 16 maio 2019.

SHARP, Laurie. ESEA Reauthorization: an overview of the every student succeeds act. **Texas Journal of Literacy Education**, v. 4, i. 1, summer 2016, p. 10-16.

SOUZA, Donaldo Bello de; ALCÂNTARA, Alzira Batalha; VASCONCELOS, Maria Celi Chaves. Diagnósticos Locais do Plano de Ações Articuladas: uma análise de sua confiabilidade. **Educação**, v. 37, n. 2, p. 218-231, maio/ago. 2014.

TODOS PELA EDUCAÇÃO. **Anuário Brasileiro da Educação Básica, 2018**. São Paulo: Moderna, 2018. Disponível em: <https://todospelaeducacao.org.br/_uploads/20180824-Anuario_Educacao_2018_atualizado_WEB.pdf?utm_source=conteudoSite>. Acesso em: 30 maio 2019.

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