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The unequal geographical interiorization of a teaching improvement program in public schools in the state of Rio de Janeiro

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RESUMO

This manuscript evaluates the geographical distribution of the projects supported by the program Improvement of Teaching in Public Schools in the State of Rio de Janeiro (hereinafter ITPS) from 2007 to 2014. This program intended to bring institutions of higher education and/or research (IHER) closer to public schools, addressing relevant issues on education and science, improvements in infrastructure and continuing education to teachers. It reserved 30% of the budget to carry out projects outside the metropolitan region, aiming to bring scientific discourse closer to the population far from bigger cities. Based on document analysis available at Faperj website, the Carlos Chagas Filho Foundation for Supporting Research in Rio de Janeiro, our results show that the program covered state regions unevenly, directly marked by the number of institutions proposals in each municipality. In other words, the incidence of IHERs in a certain locality indicated a greater number of projects implemented, so schools farther from IHERs ended up less contemplated. We suggest that this geographic distribution is related to the program policies, which left to individual IHERs all implementation power about how and where to act.

PALAVRAS-CHAVE: Education and science popularization. Public school. Territorial distribution. Public policies.

INTRODUCTION

In the early 2000s the Brazilian federal government launched different development policies nationally in order to universalize schooling, increase the quality of education and foster international competitiveness (CORRÊA; PIMENTA, 2005). Among some of the approaches to achieve these goals, there was an effort to strengthen the ties between universities and basic education, promoting science popularization and university extension activities (ZITKOSKI; GENRO; CAREGNATO, 2015), as well as interiorizing higher education within our territory. The latter recommendation had been previously outlined in the National Education Plan (in Portuguese, Plano Nacional de Educação) for the 2001-2010 term to comply with the education standards already established in the Constitution of 1988 (BRASIL, 1988).

According to Ferreira (2014), only after Luiz Inácio Lula da Silva's presidency in 2003 there was a favorable political/institutional context to strengthen the role of the State in science popularization and education policies. For instance, the establishment of the Secretariat of Science and Technology for Social Inclusion (in Portuguese, Secretaria de Ciência e Tecnologia para Inclusão Social, SECIS), part of the Ministry of Science, Technology and Innovation (in Portuguese, Ministério da Ciência, Tecnologia e Inovação, MCTI). The Ministry also included the Department of Science and Technology Dissemination and Popularization (in Portuguese, Departamento de Popularização e Difusão da Ciência e Tecnologia), dedicated exclusively to science communication. As established by Decree 5.314/2004, SECIS became responsible for the elaboration, supervision and coordination of MCTI projects. This enabled a continuous launch of public edicts by federal and state research support' agencies, including, for example, the support for itinerancy proposals in scientific dissemination. Such proposals aimed to serve the population that does not have broad access to science popularization activities, to qualified scientific information and to museums and science centers (ROCHA; MARANDINO, 2017).

Innumerable new purposes in education policies aimed to promote equity and social inclusion. Despite that, some authors argue that many of these interventions were in fact authoritarian, centralizing, homogeneous and vertical, much alike previous right-wing governments (MATHEUS; LOPES, 2014; SAVIANI, 2009). Here verticality is understood as a hierarchical logic, which excludes or disregards those about to act directly in the everyday practice of these policies, such as teachers and students. Besides, some policies intertwine basic education schools and institutions of higher education and/or research (IHER), which also reflects a vertical character. At any rate, different projects in both national and regional levels were launched to bring the scientific knowledge produced in IHERs to other sectors of society beyond the scientific community itself (BRITO, 2014). These policies also encourage the implementation of several new educational and research projects. The number and variety of projects intending to increase the dialogue between IHERs range from analysis and construction of science laboratories in partner schools (PEREIRA; MANDACARI, 2018) to scientific training of teachers (BARBOSA; AIRES, 2018) and even the organization of schools' science clubs (ALMEIDA; AMORIM; MALHEIRO, 2020).

Inserted in this national context, the state of Rio de Janeiro also reflected the political party alignment with the national administration in such period. In 2007 the state government inaugurated the program Improvement of Teaching in Public Schools of the State of Rio de Janeiro, hereinafter ITPS (in Portuguese, *Programa de Apoio à Melhoria do Ensino das Escolas Públicas Sediadas no Estado do Rio de Janeiro*). The initiative was created by the Carlos Chagas Filho Foundation for Supporting Research of the State of Rio de Janeiro (in Portuguese, *Fundação Carlos Chagas Filho de Amparo à Pesquisa do Estado do Rio de Janeiro*, Faperj), with annual editions until 2014. It sought to support educational improvement initiatives in public schools, at both elementary and medium levels, located in the state of Rio de Janeiro, through projects in partnership with universities, addressing important subjects to the teaching-learning process (FAPERJ, 2007).

The program invested R$11 million (around US$2 million) during those eight years, reserving 30% of resources for projects outside the metropolitan area of the state. The grant to each approved project was up to R$ 40 thousand, between 2007 and 2010. As of 2011, the funds allocated to approved projects were divided into two categories, A and B. Category A was for projects with at least three doctoral researchers and provided values between R$ 30 thousand and R$ 60 thousand. Category B was for projects with only one doctoral researcher and provided up to R$ 30 thousand.

Its main proposals were: 1) achieving excellence in state public schools; 2) training, qualification and updating teachers at state public schools; 3) improvement of the infrastructure necessary for teaching in the state public network; 4) promoting the exchange between universities/ research institutions and public schools (FAPERJ, 2014). Only researchers with doctoral degree and employed in an institution of higher education and research (IHER) could propose and coordinate projects. As a further requirement, their proposals needed to indicate collaboration with professionals from their targeted schools (elementary and middle levels).

This program had as a basic concern improving the quality of teaching, as well as disseminating scientific knowledge to the public school appointed in the scope, bringing science to remote areas of the state. Thus, a central question emerged: was the ITPS able to reach a significant extension of the Rio de Janeiro State? From there other questions were drawn: how many and which IHERs carried out projects from these funds? Where did these institutions enact?

Massarani in 2002 pointed that, back then, there were only a few assessments about these policies and what they represent for society. Therefore, researches aimed at discussing or evaluating such policies and programs are extremely important for the current scientific scenario, in order to identify problems and outline new strategies for education, teaching and science popularization in the country.

This research intended to map the geographical scope of the ITPS program from 2007 to 2014. The municipalities supported by the project, as well as the distance between the IHER and the partner schools are identified below.

METHODOLOGY

Database analysis

The research is characterized as a qualitative and quantitative document analysis (RICHARDSON, 1999) of the grants. The lists of schools awarded by the program ITPS (FAPERJ 2007, 2008, 2009, 2010, 2011, 2012, 2013 and 2014) were available on Faperj website. This data contains the researcher's names, their institutions and projects funded by the public notice.

In 2014 Faperj published a book with a selection of projects and results obtained by the program. However, some of those summaries did not expose relevant information for our analysis, such as the research group's partner school. Therefore, in order to collect pertaining data about the program, especially the cities targeted, partner schools and location of the research groups developing the projects, we resorted to Congress proceedings, projects submitted to other funding agencies, scientific articles, monographs, dissertations, theses, among other kinds of documents.

We then consulted Google Maps to identify the average distance between the research group institution and their partner schools, for all editions of the program from 2007 to 2014. The research groups and partner schools' addresses were inserted in the routes tool. Stretch measurements were generated in the metric unit and searches held in March and July of 2019.

A database was created containing the partner schools' names and addresses, the project titles and researchers in charge, the universities, year of the grant announcement and distance between the IHER and the school. From this, tables, maps and graphs were generated using the programs: Microsoft Excel 2016, Microsoft PowerPoint 2016. The correlation coefficients were calculated in the GraphPad Prism 8 software. It should be noted that some locations were not found, as not all projects had published this information in the aforementioned sources. Thus, in Table 1 columns five and six show, respectively, the number of projects and locations found and the total number of projects from those institutions, indicating that our results reflect a significant part of the total amount.

About Rio de Janeiro State

In Brazil the political framework has three entities – the Union, states (plus a federal district), and municipalities or cities. Constitutionally, all of them must operate in a collaborative regime, although such regime has never been defined. According to the Brazilian Institute of Geography and Statistics (in Portuguese, Instituto Brasileiro de Geografia e Estatística, IBGE), the Rio de Janeiro State is one of the 27 federative units in the country, located in the Southeast coast. It has 92 cities distributed in eight regions: Baixadas Litorâneas, Centro-Sul, Costa Verde, Norte Fluminense, Médio Paraíba, Serrana, Metropolitana and Noroeste Fluminense. The capital city is also called Rio de Janeiro and located in the metropolitan region (IBGE, 2019). There are public and private IHERs across the state. In Brazil, public IHERs are managed and funded by the government, where the vast majority of undergraduate and graduate students are not charged for.

Meanwhile, private institutions are managed by private companies, such as cooperatives, foundations or private associations. Table 1 shows the number of public and private IHERs in the capital and other cities in the state between 2007 and 2014.

Table 1 - Number of public and private IHER in Rio de Janeiro between 2000 and 2014

Year	Administrative Category	Total	Capital	Other Cities
2000	Public	11	7	4
	Private	90	52	38
2001	Public	11	7	4
	Private	91	52	39
2002	Public	12	77	5
	Private	101	56	45
2003	Public	13	7	6
	Private	106	58	48
2004	Public	12	6	7
	Private	105	46	59
2005	Public	13	6	7
	Private	108	60	48
2006	Public	21	9	12
	Private	116	66	50
2007	Public	24	10	14
	Private	114	65	49
2008	Public	23	9	14
	Private	113	64	49
2009	Public	24	10	14
	Private	113	64	49
2010	Public	23	11	12
	Private	116	65	51
2011	Public	23	11	12
	Private	114	64	50
2012	Public	24	11	13
	Private	117	67	50
2013	Public	24	11	13
	Private	110	62	48
2014	Public	25	11	14
	Private	112	63	49

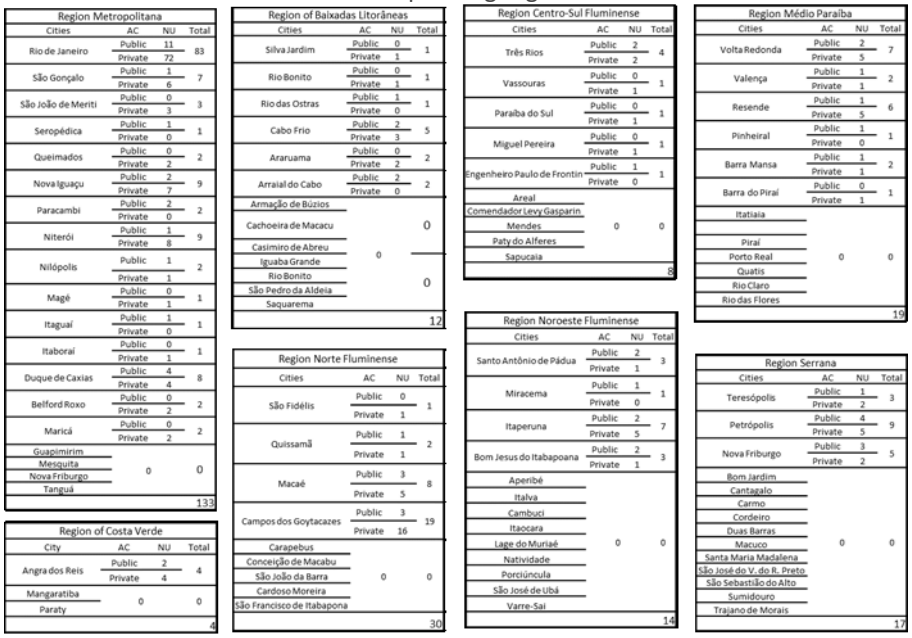
Source: Elaborated by the authors based on INEP 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2013 and 2014.

RESULTS

The state of Rio de Janeiro holds 237 IHERs spread across 44 cities in the state (48% of the total municipalities). Tables in Figure 1 show the number of public and private institutions by city. There is a great concentration of institutions in the

metropolitan region, especially the state capital, Rio de Janeiro, with 83 institutions, 11 public and 72 privates. The Norte-Fluminense region also has a significant number of institutions, 30, with Campos dos Goytacazes as the second city in the state with the largest number of institutions, 19. There are 48 cities without any institution, such as Cantagalo, Mesquita, Japeri, Guapimirim, Paraty, Mangaratiba, Itaocara, among others.

Figure 1 - Number of public and private IHERs in each city of Rio de Janeiro State and its corresponding region

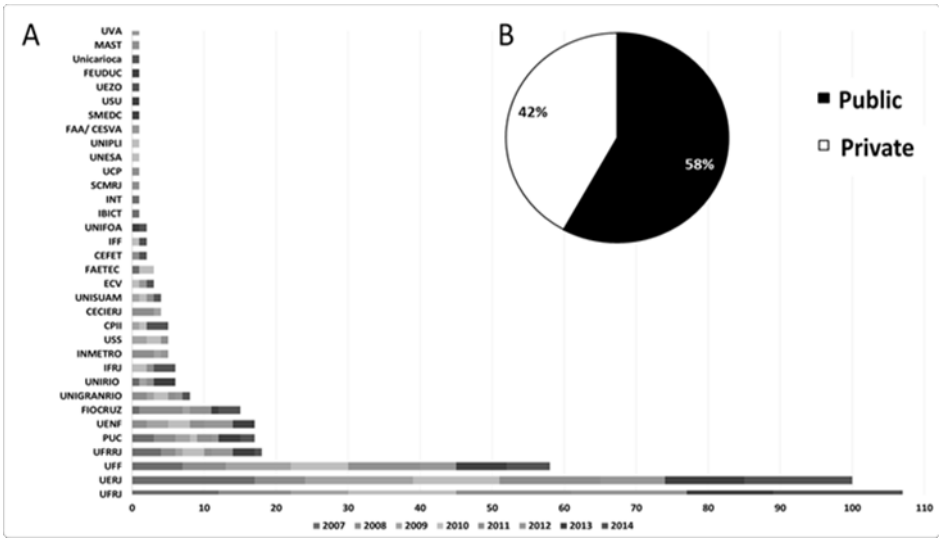


Source: The authors (2021).

AC – Administrative category; NU – Number of IHERs. Data obtained from the platform National Registry of Courses and Higher Education Institutions (e-mec: http://emec.mec.gov.br/). Access on February 20, 2020.

From this scenario, 34 IHERs had projects funded by the program (Figure 2, A) and three institutions stand out: the Universidade Federal do Rio de Janeiro (UFRJ) with 107 projects; the Universidade do Estado do Rio de Janeiro (UERJ) with 100 projects and the Universidade Federal Fluminense (UFF) with 58 projects. It is important to notice that most of the projects (58%) were carried out by public institutions (Figure 2, B), while 42% were private. Not only universities and/or research institutes were contemplated; but also, science centers/museums, such as Espaço Ciência Viva, and basic education institutions, such as Colégio Pedro II. We point out that there was no explicit contemplation of non-formal educational spaces in the analyzed edicts; the participation of institutions of this nature was very low, less than 1%. Such institutions are known for their intense communication with IHERs through university extension projects, even having in their staff professionals from IHERs with a PhD degree, a requirement for submission as coordinator of projects in the program. Additionally, we emphasize the fact that many museums and science centers are state funded, with few exceptions, such as the case of Espaço Ciência Viva. Additionally, we remember that non-formal spaces are intended to complement formal education and not replace it.

Figure 2 – (A) Number of projects carried out by each institution and (B) percentage of contemplated public and private institutions



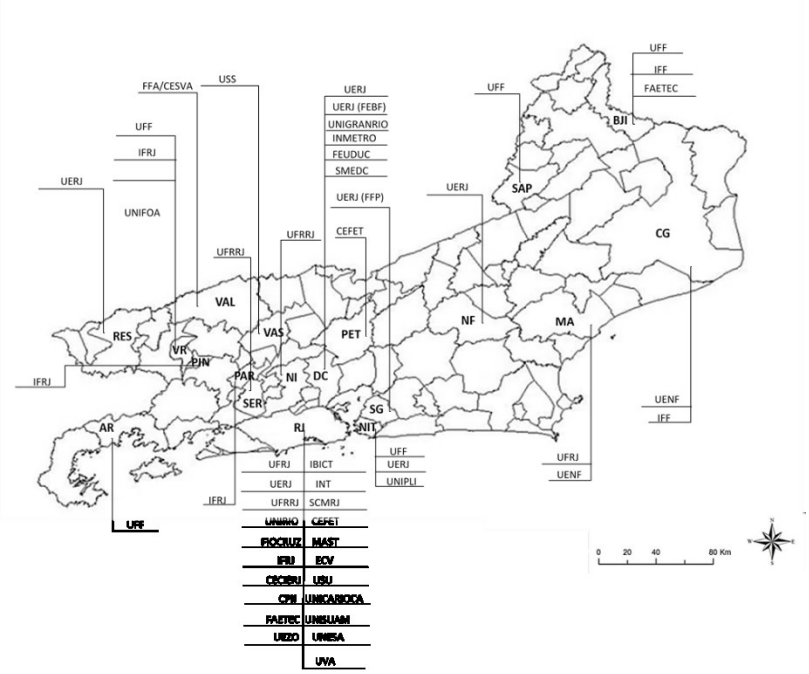
Source: The authors (2021).

(A) The graph shows the names of the 34 institutions with research groups funded by the program, and the number of projects carried out by each of them yearly (2007-2014). The institutions that performed most projects were: UFRJ (107), UERJ (100) and UFF (58). **(B)** Among the institutions covered by the program edicts, 58% were public and 42% were private.

Regarding the location of these contemplated institutions, Figure 3 reads distribution across several municipalities and regions in the state. Seven out of the eight state regions had institutions or their campi contemplated by the program, Metropolitana (34 institutions); Médio Paraíba (6 institutions); Noroeste Fluminense (4 institutions); Norte Fluminense (4 institutions); Serrana (2 institutions); Centro-Sul Fluminense (1 institution) and Costa Verde (1 institution). No institution from the Baixadas Litorâneas region participated in this program, although this region has twelve IHERs (Figure 1).

Among the 92 municipalities, only 19 of them comprised institutions awarded by the program. This indicates great concentration of institutions in specific regions and municipalities: 21 institutions contemplated in the city of Rio de Janeiro, six in Duque de Caxias, three institutions in Niterói, Volta Redonda and Bom Jesus do Itabapoana each, two in Campos dos Goytacazes and Macaé each and one in Pinheiral, Resende, Angra dos Reis, Valença, Paracambi, Seropédica, Vassouras, Nova Iguaçu, Petrópolis, São Gonçalo, Nova Friburgo and Santo Antônio de Pádua each.

Figure 3 - Geographical distribution of contemplated IHERs and their campi in Rio de Janeiro state



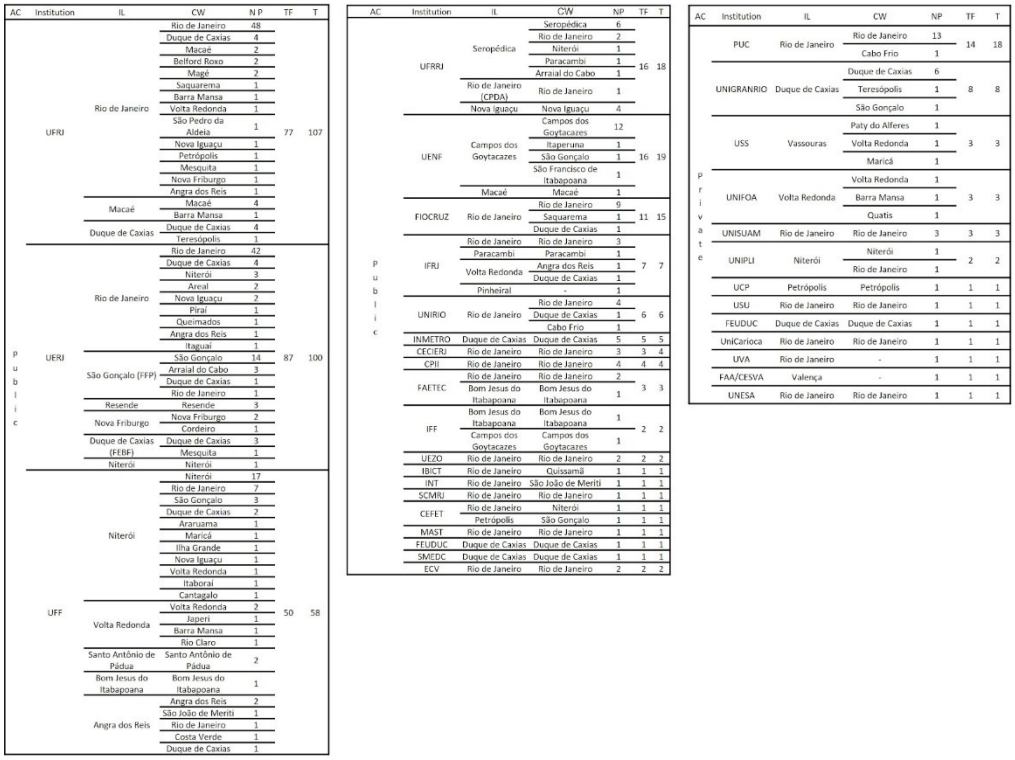
Source: The authors (2021).

There is a centrality of institutions in the metropolitan region, being the capital with the largest number (21 institutions). **Rio de Janeiro (RJ):** UFRJ (Universidade Federal do Rio de Janeiro), UERJ (Universidade Estadual do Rio de Janeiro), UFRRJ (Universidade Federal Rural do Rio de Janeiro), UNIRIO (Universidade Federal do Rio de Janeiro), FIOCRUZ (Fundação Oswaldo Cruz), IFRJ (Instituto Federal do Rio de Janeiro), CECIERJ (Fundação Centro de Ciências e Educação Superior a Distância do Estado do Rio de Janeiro), CPII (Colégio Pedro II), FAETEC (Fundação de Apoio à Escola Técnica), UEZO (Centro Universitário Estadual da Zona Oeste), IBICT (Instituto Brasileiro de Informação em Ciência e Tecnologia), INT (Instituto Nacional de Tecnologia), SCMRJ (Santa Casa da Misericórdia do Rio de Janeiro), CEFET (Centro Federal de Educação Tecnológica Celso Suckow da Fonseca), MAST (Museu de Astronomia e Ciências Afins), ECV (Espaço Ciência Viva), USU (Universidade Santa Úrsula), UniCarioca (Centro Universitário Carioca), UNISUAM (Centro Universitário Augusto Motta), UNESA (Universidade Estácio de Sá) e UVA (Universidade Veiga de Almeida); **Duque de Caxias (DC):** UFRJ, UERJ – FEBF (Universidade Estadual do Rio de Janeiro - Faculdade de Educação da Baixada Fluminense), UNIGRANRIO (Universidade Grande Rio), INMETRO (Instituto Nacional de Metrologia, Qualidade e Tecnologia), FEUDUC (Fundação Educacional de Duque de Caxias) e SMEDC (Secretaria Municipal de Educação de Duque de Caxias); **Bom Jesus do Itabapoana (BJI):** UFF (Universidade Federal Fluminense), IFF e FAETEC (Fundação de Apoio à Escola Técnica); **Volta Redonda (VR):** UFF, IFRJ (Instituto Federal do Rio de Janeiro) e UniFOA (Centro Universitário de Volta Redonda); **Niterói (NIT):** UFF (Universidade Federal Fluminense), UERJ (Universidade do Estado do Rio de Janeiro) e UNIPLI (Centro Universitário Plínio Leite); **Macaé (MA):** UFRJ e UENF (Universidade Estadual do Norte Fluminense Darcy Ribeiro); **Campos dos Goytacazes (CG):** UENF e IFF (Instituto Federal

Fluminense); **Angra dos Reis (AR):** UFF; **Resende (RES):** UERJ (Universidade Estadual do Rio de Janeiro); **Pinheiral (PIN):** IFRJ; **Valença (VA):** FAA/ CESVA (Centro de Ensino Superior de Valença); **Paracambi (PAR):** IFRJ; **Seropédica (SER):** UFRRJ; **Vassouras (VAS):** USS (Universidade Severino Sombra); **Nova Iguaçu (NI):** UFRRJ (Universidade Federal Rural do Rio de Janeiro); **Petrópolis (PET):** CEFET; **São Gonçalo (SG):** UERJ – FFP (Universidade do Estado do Rio de Janeiro - Faculdade de Formação de Professores); **Nova Friburgo (NF):** UERJ e **Santo Antônio de Pádua (SAP):** UFF.

Figure 4 shows that some institutions carried out part of their work in cities outside their place of origin, but the majority of projects were carried out in the same city. We can note as an expansion example the case of UFRJ (campus located in the city of Rio de Janeiro), which operated in 14 different cities with an average displacement of 86.6 km. However, 48 out of the 77 projects retrieved by our research were executed within the city of Rio de Janeiro alone. This trend was also reflected for another UFRJ campi. Research groups from the Macaé campus, at the Norte Fluminense region, executed projects in Barra Mansa, 9.7 km away, but most of the researchers addressed their original city. Another exponent is UERJ (Rio de Janeiro campus), which worked in 9 cities, but out of 87 projects found, 42 were in the same municipality. As well as the Faculdade de Formação de Professores, a college from UERJ in the capital but located in São Gonçalo, whose research groups as expected worked massively in São Gonçalo. This group also worked in Arraial do Cabo (130 km away from point of origin), Duque de Caxias (59 km) and Rio de Janeiro (66.5 km).

Figure 4 - Table indicating institutions awarded, public and private, their city locations, municipalities where projects were developed and the number of projects performed



AC	Institution	IL	CW	N.P	TF	T
Public	UFRJ	Rio de Janeiro	Rio de Janeiro	48	77	107
			Duque de Caxias	4		
			Macaé	2		
			Belford Roxo	2		
			Magé	2		
			Saquarema	1		
			Barra Mansa	1		
			Volta Redonda	1		
			São Pedro da Aldeia	1		
			Nova Iguaçu	1		
			Petrópolis	1		
			Mesquita	1		
			Nova Friburgo	1		
			Angra dos Reis	1		
		Macaé	Macaé	4		
		Duque de Caxias	Barra Mansa	1		
			Duque de Caxias	4		
			Teresópolis	1		
	UERJ	Rio de Janeiro	Rio de Janeiro	42	87	100
			Duque de Caxias	4		
			Niterói	3		
			Areal	2		
			Nova Iguaçu	2		
			Piraí	1		
			Queimados	1		
			Angra dos Reis	1		
			Itaguaí	1		
		São Gonçalo (FFP)	São Gonçalo	14		
			Arraial do Cabo	3		
			Duque de Caxias	1		
			Rio de Janeiro	1		
		Resende	Resende	3		
		Nova Friburgo	Nova Friburgo	2		
			Cordeiro	1		
		Duque de Caxias (FEBF)	Duque de Caxias	3		
			Mesquita	1		
		Niterói	Niterói	1		
	UFF	Niterói	Niterói	17	50	58
			Rio de Janeiro	7		
			São Gonçalo	3		
			Duque de Caxias	2		
			Araruama	1		
			Maricá	1		
			Ilha Grande	1		
			Nova Iguaçu	1		
			Volta Redonda	1		
			Itaboraí	1		
			Cantagalo	1		
		Volta Redonda	Volta Redonda	2		
			Japeri	1		
			Barra Mansa	1		
			Rio Claro	1		
		Santo Antônio de Pádua	Santo Antônio de Pádua	2		
		Bom Jesus do Itabapoana	Bom Jesus do Itabapoana	1		
		Angra dos Reis	Angra dos Reis	2		
			São João de Meriti	1		
			Rio de Janeiro	1		
			Costa Verde	1		
			Duque de Caxias	1		

AC	Institution	IL	CW	NP	TF	T
Public	UFRRJ	Seropédica	Seropédica	6	16	18
			Rio de Janeiro	2		
			Niterói	1		
			Paracambi	1		
			Arraial do Cabo	1		
		Rio de Janeiro (CPDA)	Rio de Janeiro	1		
		Nova Iguaçu	Nova Iguaçu	4		
	UENF	Campos dos Goytacazes	Campos dos Goytacazes	12	16	19
			Itaperuna	1		
			São Gonçalo	1		
			São Francisco de Itabapoana	1		
		Macaé	Macaé	1		
	FIOCRUZ	Rio de Janeiro	Rio de Janeiro	6	11	15
			Saquarema	1		
			Duque de Caxias	1		
	IFRJ	Rio de Janeiro	Rio de Janeiro	3	7	7
		Paracambi	Paracambi	1		
		Volta Redonda	Angra dos Reis	1		
			Duque de Caxias	1		
		Pinheiral	-	1		
	UNIRIO	Rio de Janeiro	Rio de Janeiro	4	6	6
			Duque de Caxias	1		
			Cabo Frio	1		
	INMETRO	Duque de Caxias	Duque de Caxias	5	5	5
	CECIERJ	Rio de Janeiro	Rio de Janeiro	3	3	4
	CPII	Rio de Janeiro	Rio de Janeiro	4	4	4
	FAETEC	Rio de Janeiro	Rio de Janeiro	2	3	3
		Bom Jesus do Itabapoana	Bom Jesus do Itabapoana	1		
	IFF	Bom Jesus do Itabapoana	Bom Jesus do Itabapoana	1	2	2
		Campos dos Goytacazes	Campos dos Goytacazes	1		
	UEZO	Rio de Janeiro	Rio de Janeiro	2	2	2
	IBICT	Rio de Janeiro	Quissamã	1	1	1
	INT	Rio de Janeiro	São João de Meriti	1	1	1
	SCMRJ	Rio de Janeiro	Rio de Janeiro	1	1	1
	CEFET	Rio de Janeiro	Niterói	1	1	1
		Petrópolis	São Gonçalo	1	1	1
	MAST	Rio de Janeiro	Rio de Janeiro	1	1	1
	FEUDUC	Duque de Caxias	Duque de Caxias	1	1	1
	SMEDC	Duque de Caxias	Duque de Caxias	1	1	1
	ECV	Rio de Janeiro	Rio de Janeiro	2	2	2

AC	Institution	IL	CW	NP	TF	T
Private	PUC	Rio de Janeiro	Rio de Janeiro	13	14	18
			Cabo Frio	1		
	UNIGRANRIO	Duque de Caxias	Duque de Caxias	6	8	8
			Teresópolis	1		
			São Gonçalo	1		
	USS	Vassouras	Paty do Alferes	1	3	3
			Volta Redonda	1		
			Maricá	1		
	UNIFOA	Volta Redonda	Volta Redonda	1	3	3
			Barra Mansa	1		
			Quatis	1		
	UNISUAM	Rio de Janeiro	Rio de Janeiro	3	3	3
	UNIPLI	Niterói	Niterói	1	2	2
			Rio de Janeiro	1		
	UCP	Petrópolis	Petrópolis	1	1	1
	USU	Rio de Janeiro	Rio de Janeiro	1	1	1
	FEUDUC	Duque de Caxias	Duque de Caxias	1	1	1
	UniCarioca	Rio de Janeiro	Rio de Janeiro	1	1	1
	UVA	Rio de Janeiro	-	1	1	1
	FAA/CESVA	Valença	-	1	1	1
	UNESA	Rio de Janeiro	Rio de Janeiro	1	1	1

Source: The authors (2021).

Note that several research groups from different campi at the same university were contemplated. For example, UFRJ campus Rio de Janeiro, Macaé and Duque de Caxias executed projects in different locations in the state. There is a certain proximity between the research group locations and the schools where they executed the projects. Importantly, not all projects were localized in our research, but the last two columns of the table show that most of them were localized. AC – Administrative Category; IL – Institution Location; NP – Number of Projects; TF – Total Found.

This regularity was also found in private institutions. The Pontifícia Universidade Católica (PUC-Rio), located in the city of Rio de Janeiro, executed 14 projects. From these, 13 were held in the same city, while one project reached Cabo Frio, 155 km away. The Universidade do Grande Rio (UNIGRANRIO) executed eight projects total, six in Duque de Caxias (city of origin), one in Teresópolis and one in São Gonçalo. Finally, the same pattern was noticed for institutions located outside the metropolitan region. The Universidade Estadual do Norte Fluminense Darcy Ribeiro (UENF), located in Campos dos Goytacazes, in the Norte Fluminense region, carried out 16 projects with 13 of them in the same city and one in Itaperuna, 111 km away and one in São Francisco de Itabapoana, 51.2 km distant. This trend was also repeated at UENF (Macaé campus), which carried out one project in Macaé.

In line with this data, we conclude there was a relevant proximity between IHERs and partner schools. Line four in Table 2 shows that the distances in kilometers per program averaged from 15.1 km to 41.1 km during those eight years.

Table 2 - Table indicating the number of projects per city, per cities affected for the first time and the average distances between universities/research centers and partner schools over the program years

GRANTS	2007	2008	2009	2010	2011	2012	2013	2014
Number of counties	12	10	10	17	14	14	16	11
Counties affected for the first time	12	4	3	7	4	4	4	2
Average distance institutions (km)	35.4	27.4	15.13	40.4	25.2	26,03	41.16	30.8

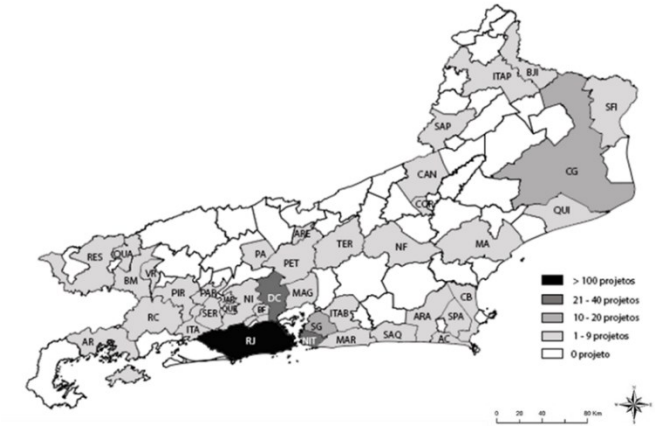
Source: The authors (2021).

Although the number of locations remained stable, new locations were reached every year. It is also evident that the average distance between the institutions and their partner schools was short, i.e, the research groups carried out projects near their locality.

Interestingly, some institutions only executed projects outside their own cities. For instance, Universidade Severino Sombra is located in Vassouras, Centro-Sul Fluminense region, and implemented projects in Paty do Alferes (38 km away) and Maricá (154 km), as well as the Instituto Brasileiro de Informação em Ciência e Tecnologia (IBICT), which is located in Rio de Janeiro city and worked in Quissamã, 235 km away.

Table 2 also shows that 43 of the 92 cities (46,7%) were contemplated by the ITPS during its eight years of existence. There was some stability in the number of cities reached across all years (line 1, table 2), however, line 2 of table 2 shows a constant increase in the number of locations addressed for the first time every year. For example, in 2008, 8 out of 15 cities were different from the previous year, such as Piraí, Resende, Campos dos Goytacazes, Barra Mansa, Maricá, Volta Redonda, Petrópolis and Bom Jesus de Itabapoana. In addition, in 2010 eight new locations were incorporated: Arraial do Cabo, Nova Iguaçu, Cabo Frio, Rio Claro, Santo Antônio de Pádua, Paracambi, Japeri and Cordeiro. These observations indicate a gradual process of expansion and interiorization of the program.

Figure 5 - Geographic distribution of projects linked to the program Supporting the Improvement of Teaching in Public Schools in the State of Rio de Janeiro (2007-2014)



Source: The authors (2021).

Angra dos Reis (AR), Araruama (ARA), Areal (ARE), Arraial do Cabo (AC), Barra Mansa (BM), Belford Roxo (BF), Bom Jesus do Itabapoana (BJI), Cabo Frio (CB), Campos dos Goytacazes (CG), Cantagalo (CAN), Cordeiro (COR), Duque de Caxias (DC), Itaboraí (ITAB), Itaguaí (ITA), Itaperuna (ITAP), Macaé (MA), Magé (MAG), Maricá (MAR), Mesquita (MES), Niterói (NIT), Nilópolis (NIL), Nova Friburgo (NF), Nova Iguaçu (NI), Paracambi (PAR), Paty do Alferes (PA), Petrópolis (PET), Piraí (PIR), Quatis (QUA), Queimados (QUE), Quissamã (QUI), Resende (RES), Rio Claro (RC), Rio de Janeiro (RJ), Santo Antônio de Pádua (SAP), São Francisco do Itabapoana (SFI), São Gonçalo (SG), São João de Meriti (SJM), São Pedro da Aldeia (SPA), Saquarema (SAQ), Seropédica (SER), Teresópolis (TER) and Volta Redonda (VR).

The map shows the cities related by the projects during the 8 years. Of the 92 counties in the state, 43 had projects linked to the program. The state capital presented more than 100 projects, while Niterói and Duque de Caxias were awarded with 21 to 40 projects, Campos dos Goytacazes and São Gonçalo received 10 to 20 projects and Nova Iguaçu and Macaé were related from 1 to 9 projects. The cities in white did not receive projects. Thus, it was seen that the cities that have the largest number of universities and / or research institutions or are close to them are also the ones most favored by the program.

The map in figure 5 clearly shows the program interiorization within the Rio de Janeiro state territory. However, it also became evident the arrangement or reinforcement of conglomerates in some locations (Metropolitana, Médio Paraíba and Norte Fluminense regions). If on one hand the program stretched to cities far from the capital, such as Bom Jesus do Itabapoana, on the other hand, cities in the Metropolitana (Rio de Janeiro, Duque de Caxias, São Gonçalo) and Norte Fluminense regions (Campos dos Goytacazes) still received massively more projects. These regions, as mentioned, comprise a higher number of IHERs than other parts of the state.

We performed a correlation analysis between the data in Figure 1 (number of IHERs per city) and Figure 4 (number of projects per city). We found a strong correlation (r = 0.96) between the distribution of IHERs in the territory and the number of ITPS projects in the municipalities.

DISCUSSION

In view of the National Education Plan, law nº. 10.172/ 2001 (BRASIL, 2001), the interiorization of public universities campi or inauguration of new universities in Brazil began in 2003. This expansion increased the access of low-income classes to free public universities, as well as contributed to the regionalization of higher education vacancies throughout the country (MEDEIROS, 2008). This movement of expansion and interiorization exerted a great impact in education and economics in Brazilian states (CAMARGO; ARAÚJO, 2018). In the state of Rio de Janeiro several public universities were opened or expanded during this period (from 11 in 2001 to 25 in 2014) such as UFF in Volta Redonda (2005), UEZO (2005), UFRRJ in Nova Iguaçu (2006), UFRJ in Xerém (2008), IFRJ in Pinheiral, Paracambi and Volta Redonda (2009), UFF in Santo Antônio Padua (2009), IFF in Bom Jesus do Itabapoana (2009), also UENF in Campos de Goytacazes, which had opened in 1991 (BRAZIL, 2014; NOMERIANO, 2012). Besides, new private colleges and universities were established in several cities during this period (from 91 in 2001 to 112 in 2014).

The process of university interiorization is crucial for socioeconomic development and can influence the schools surrounding these IHERs. Some studies related to rural schools have shown that teachers in these areas face difficulties to access adequate professional training (HARMON et al. 2007). Miller and Hafner (2015) believe that universities can help schools in rural districts in the continuing education of these teachers, with the creation of more accessible curriculum models and design specific programs for local needs. In the same line, Ball (2012) states that the locality where the school is inserted is an active force, not just a background. Although education policies are shaped similarly for schools whether urban or rural, these policies are operated in different ways due to the territorial context where the school is inserted, which may offer opportunities or advantages.

According to ITPS ordinance, Faperj reserved 30% of the program budget to carry out projects outside the metropolitan region (FAPERJ, 2014). Our results show that the metropolitan region was the main area covered by the program, with 64.8% of projects financed, contrasting with 35.2% for other regions, very close to the reserved quota of 30%. This suggests that the expansion and interiorization of universities previously implemented by the federal government helped the propagation of this program.

Meanwhile these numbers still reveal an unequal geographical distribution within the Rio de Janeiro state. Such inequality was indicated by Baixadas Litorâneas, a region that comprises eight cities and 12 IHERs, but was not represented in this program. Overall, 57.7% of cities were not attended by the project, since the program only managed to reach 42.3% of the total amount of municipalities in the state of Rio de Janeiro during its eight years of existence.

In contrast, the North Fluminense region, encompassing the cities of Campos dos Goytacazes and Macaé, presented one of the largest increases of projects implemented by the program. Campos dos Goytacazes is known as an education hub in the interior of the state (TAVARES; OLIVEIRA, 2016), having in its territory, in 2005, approximately 12 public and private universities. Among those, we mention the Universidade Estadual do Norte Fluminense Darcy Ribeiro (UENF), a campi of the Universidade Federal Fluminense (UFF) and the Centro Federal de

Educação Tecnológica de Campos (CEFET-Campos), which attract thousands of students to the region (GIVISIEZ; OLIVEIRA; PIQUET, 2006).

Besides these exceptions, the distribution rate of projects linked to the program was proportional to the number of universities and/or research institutions by region. The metropolitan region, for example, was the most covered by the program and has the largest incidence of higher education and research institutions. It is important to point out that the program did not provide a specific amount for all approved projects. Higher values were not necessarily intended for projects carried out far from the IHERs, even considering that only 10% of the approved value could be used for travel expenses.

Another fact that may have contributed to such irregular geographical distribution is the vertical design of this program, which required the project coordinator to be a professional from an IHER with doctoral degree. This requirement was included in the edicts every year, as mentioned below:

> "2.1 Researchers employed in public or private higher education and research institutions headquartered in the State of Rio de Janeiro are eligible as proponents, always in collaboration with professionals from public schools (primary and secondary levels) headquartered in the same state;" FAPERJ, 2009.

As seen, despite being a program aimed to support the improvement of teaching in public basic education schools, there is no obligation to include someone from the school's social body among the actors involved in the coordination of the projects. The school staff joins with a collaborative function, serving as a bridge with the IHER, instead of a de facto agent able to change the direction of the developed projects. We do not exclude the possibility of this dialogue between researchers and teachers having happened horizontally in practice, but we warn that the Faperj edicts did not guarantee the protagonism for teachers and other professionals in basic education. This vertical character was also marked in the second specific objective "the training and updating of public school teachers". There are no mentions that coordinating researchers of the projects could also learn from the actors in the schools, reinforcing the vertical relationship between IHER and the partner school.

The vertical character of public policies that deal with communication between IHERs and schools is not unprecedented in our country nor in the world. In Brazil, the Teaching Initiation Program (in Portuguese, Programa de Iniciação à Docência), a federal program by the Ministry of Education, is an example of policy related to teacher education, which fosters communication between IHER-school. In a critical-discursive analysis of laws, decrees, ordinances, resolutions and notices published between 2007 and 2014 about the PIBID, Mateus, in 2014, points to how political initiatives such as these cannot be considered unique and salvationist for teacher training and, consequently, for the improvement of teaching. In addition, she stresses the regulatory aspect of PIBID, shaping ideal pedagogical practices, attenuating the various other difficulties in the school environment (not necessarily related to the pedagogical field) and setting up an archetype of apparent solution to highly complex issues. In contrast, Rosa, in 2016, based on the PIBID precepts to analyze teachers' training projects between UFMS and partner

schools, reported a promising result mainly due to the school's role as a privileged locus for teacher's training and recognizing teachers as partner actors.

In the book "How schools do policies" (2012), Stephen Ball and collaborators carry out interviews with a school community in the United Kingdom, trying to implement what they call "policy auditing" in some secondary schools. Their investigation points out that teachers, coordinators, principals and other members of this environment, inside and outside the school (including students), tend to be left out of the policy-making process or seen as voiceless figures to simply implement the programs. They showed that schools, despite serving as mere receptacles for government policies, do produce their own reinterpretations of these interventions. The authors quoted Ozga (2000) to expose that while many policies applied in schools were written by the government, its agencies or influential investors, the implementation of policies anywhere at any level also involves negotiation, contestation or struggle among the different groups that may be outside the official policy-making machine. From this perspective, politics was not (or must not be) developed only in the formal political sphere, but in a continuous and cyclical manner with the participation of all other social realms, in our case specifically the scientific and school community (BALL, 1994). This construction takes place through dialogue with different discourses and sectors of society (LOPES, 2000, 2002 and 2004).

Several authors from other countries show similar results and critique. Strier (2011) evaluated a partnership between a university and a community in Israel, based on a qualitative examination of the participants life experiences. He found that this partnership process was highly affected by several variables, such as power asymmetry between the parties (community-university), unequal access to decision-making processes, different perceptions of what the concept of partnership entails, as well as role conflicts, issues on organizational culture, institutional context and world views. With criticism, he indicated the centrality and "top-down" approach from the university.

In a subsequent work, the same research group pointed out that university members strived to increase school community access to resources, whether educational, economic, or political, in order to break those typical barriers. However, from a school community perspective, knowledge production still remains an academic privilege, sustaining and reinforcing unequal point of views (STRIER, 2011; SHECHTER; STRIER, 2016).

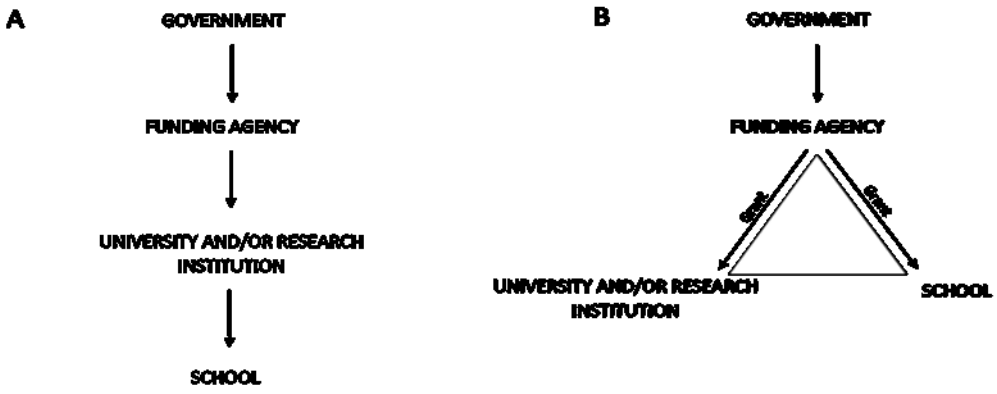
Walsh and Backe (2013) analyzed a program called City Connects, that aimed at the collaboration between Boston College University and surrounding public schools. Such program, similarly, to the case study in this article, sought to intertwine the university and some schools in order to create strategies for improving teaching. Although the partnership between school and university offered great opportunities, they showed that it also presented challenges and conflict of interests. The university and schools not necessarily have the same motivation and objectives when building projects.

Increasing the school leader's representation should result in a better distribution of projects all over Rio de Janeiro state. In order to decrease the unequal distribution showed here and to take into account those school actors, we do believe it is necessary to generate non-vertical policies and programs that

prioritize decentralization in its construction and implementation, as showed in Figure 6B, breaking the vertical representation in Figure 6A, that typically dominates the edicts and ordinances.

It is urgent to give schools the power to write their own projects and autonomy to seek partnerships with a wider array of institutions and universities. Ideally both the school and the university can build projects together and horizontally, overcoming hierarchical levels. Once this autonomy is achieved, we might no longer detect concentration of projects being carried out close to major capitals and universities, as showed in this work for the case of Rio de Janeiro State. Noteworthy to point out that this does not entail a proposal for a policy model with an inverted demand; where only schools should write projects. This would maintain the vertical character criticized in the present article, in another sense, a bottom-up approach.

Figure 6 - Analysis scheme between the relationship of the institutions involved in the program Supporting the Improvement of Teaching in Public Schools in the State of Rio de Janeiro



Source: The authors (2021).

Scheme A shows a vertical relationship between the institutions that act on each other and are above the contemplated schools. That is, the school becomes (only) a space for receiving the project. Scheme B represents a "horizontal" relationship suggested in this article between the funding agency, universities and/ or research institutions, and schools. This relationship occurs so that the three institutions cited participate from the initial processes to the implementation of the project. This way, the school is also included and now has a voice, that is, it is no longer just the place where the research groups act.

CONCLUSIONS

This article evaluates the geographical distribution of the program Improvement of Teaching in Public Schools in the State of Rio de Janeiro, by Faperj, from 2007 to 2014. We observed that public IHERs carried out most of the projects within the program. In addition, we concluded that the number of IHERs in a city was directly proportional to the number of projects carried out in public schools there. In other words, IHERs worked with nearby schools, although the program expected to disseminate the projects geographically. We also suggest that the

previous expansion of IHERs influenced the geographical coverage of the program in the state. Regarding our main question, “was the program able to reach a significant extension of the Rio de Janeiro State?”, we note that ITPS reached 40% of the state's municipalities but covered the territory unevenly. In order to overcome this and the excessive centrality given to the higher institutions in this program, we indicate that policy wording merely encouraging geographical dissemination is not enough. We need policies and programs that break the government > IHER > school verticality in education and science popularization, in other words, approaches that also prioritize the democratic development of projects, believing that schools are also a space for struggle, opinion and knowledge construction. Future developments of this research are already underway, such as the use of questionnaires and semi-structured interviews with the social body of the participating schools and with the researchers involved in the coordination of the projects to deepen this debate.

A interiorização geográfica desigual de um programa de apoio à melhoria do ensino das escolas públicas do estado do Rio de Janeiro

RESUMO

Este manuscrito avaliou a distribuição geográfica dos projetos apoiados pelo Programa Apoio à Melhoria do Ensino nas Escolas Públicas do Estado do Rio de Janeiro, que ocorreu entre 2007 e 2014. Este programa buscava aproximar instituições de ensino superior e/ou pesquisa (IES) das escolas públicas abordando temas relevantes em Educação e Ciências e/ou promovendo melhoria na infraestrutura e formação continuada a professores. O programa reservava 30% do orçamento para a realização de projetos fora da região metropolitana, incentivando a itinerância, que visa aproximar o discurso científico da população distante das grandes cidades. Com base na análise documental disponibilizada no site da Faperj, Fundação Carlos Chagas Filho de Amparo à Pesquisa do Rio de Janeiro, nossos resultados mostram que o programa abrangeu as regiões do estado de maneira desigual, marcada diretamente pelo número de instituições propostas em cada município. Ou seja, a incidência de IES em determinada localidade indicava um maior número de projetos implantados, portanto, escolas mais distantes das IES acabaram sendo menos contempladas. Sugerimos que essa distribuição geográfica esteja relacionada às políticas do programa, que deixam o poder de onde e como acontecerá a implementação dos projetos nas mãos das IES.

KEYWORDS: Popularização Científica. Escolas públicas. Distribuição geográfica. Política educacional.

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