EDUCATIONAL POLICIES AND SCHOOL PERFORMANCE IN THE BRAZILIAN CAPITAL OF STATES

FÁTIMA ALVES
Department of Education of the Pontifical Catholic University of Rio de Janeiro
fcalves0705@terra.com.br

Translation: Robert Dinham

ABSTRACT

On the basis of data from the Brazilian National Assessment of Basic Education, this paper investigates, in the set of schools attached to each local authority within the capital of Brazilian states, the association of educational policies and 4th grade students' school performances, during the period of 1999-2003. Multilevel cross-classified models were used in order to take into account the structure of the data (students' performance, set of schools and assessment years). Also, the analysis included statistical control for students' socioeconomic levels and for their social composition within the set of schools under the administration of each local authority. The results indicate that merit-based processes for appointing principals, financial autonomy of schools, external assessment of schools, offer of pre-schools' enrollments, and a higher percentage of teachers with more than a high school degree are factors associated to a higher than average school performance. Finally, the consequences for the formulation of the agendas of educational policies are discussed.
EDUCATIONAL POLICIES – TEACHING QUALITY – PUBLIC POLICIES – STUDENTS'S SCHOOL PERFORMANCE

Until the end of the 1970s and the beginning of the 1980s the improvement in educational indicators that sum up the amount of education that Brazil's population receives could be explained mainly by aspects related to changes in the demographic structure of the population: not only did a decrease in people of school age result in less overall demand for education, but the urbanization process and the relatively greater academic level of mothers contributed to an increase in the number of years education

completed by children and young people. In the 1990s the improvement in the same indicators was due mainly to the greater internal effectiveness of the education system (Silva, Hasenbalg, 2000). Brazilian education has undergone a great transformation, whether because of the redistribution of responsibilities and functions between the various levels of government, or because of the inclusion of new segments of the population, with very particular socio-economic profiles. At this time, the center of educational policy was marked by a series of legal innovations and actions/programs coming from the Ministry of Education (MEC), which had repercussions on the implementation of educational policies in the states and municipalities related to, for example, education system organization (learning cycles and nine years of elementary education instead of eight); early childhood education; assessment systems; procedures for choosing school principals; financial autonomy and teacher training.

Nevertheless, despite the advances obtained in previous decades, Brazil still has serious problems with education: a) initiatives for reducing even further the rate of illiteracy have not been successful; b) the improvement in school flow has stagnated since 1998, with rates of failure and a lag between age and grade remaining high; and c) performance assessments of Brazilian students, especially the Basic Education Assessment System (*SAEB*), point to the poor quality of Brazilian education, with a very significant proportions of students completing the 4th grade of elementary education without acquiring the basic skills in reading and mathematics.

These aspects are a problem in the current education scene in Brazil and the challenge for researchers is to understand how the social dynamic and educational policies relate to the evolution of educational indicators. The objective of this work is to reply to the following questions: up to what point can the differences in performance between the state and municipal educational systems be explained by the social profile of their students; to what extent can the difference in averages be explained by the educational policies implemented in the state and municipal networks; what is relationship between academic performance, school flow and educational policies?

Initially, I show that the legal apparatus that was instituted in the 1990s represented a favorable context for the implementation of educational policies in the three spheres of government. Then, I present an analytical approach to the specification of the models that estimate the association between academic performance and educational policies. Subsequently, the results are discussed in the light of international and Brazilian literature. The article ends by revisiting the main findings and discussing

the consequences of the results for the formulation of the agenda for educational policies.

THE 1990s: A NEW CONTEXT FOR IMPLEMENTING EDUCATIONAL POLICIES

Inter-governmental relationships which were until then determined by the military regime, with the return to direct elections for governor in 1982 and the publication of the Federal Constitution in 1988, changed. At the political and institutional level, the 1990s can be characterized by an increase in the autonomy of state and particularly municipal governments, since the Federal Constitution established fiscal decentralization mechanisms. For the first time ever, municipalities were defined as federative entities.

In the educational area, it was during the government of Fernando Henrique Cardoso that a more effective impetus occurred in the implementation of directives for establishing responsibilities and powers at each level of government and in the management of financial resources. The milestones were the approval of the Law of National Education Directives and Bases (*LDB*) (Law 9394/96) and the creation of the Fund for Maintaining and Developing Elementary Education and for Valuing the Teaching Profession (*Fundef*) in 1996.

The Federal constitution of 1988 and the *LDB* of 1996 gave legal backing for municipalities to establish their own teaching systems, with relative autonomy when it came to the formulation of educational policies, above all for infant and elementary education. In Brazil, it was traditionally the responsibility of the states and municipalities to manage their own educational systems and pay the teachers. Other activities used *MEC* resources, with no legal devices that defined the powers and obligations at each teaching level. As a consequence, this led to two educational systems (state and municipal), that operated in parallel and had overlapping responsibilities.

This is the playing field on which the new guidelines and norms developed: the definition of the joint responsibility of state and municipal governments for providing elementary education (municipalities were responsible for providing infant education and states for high school education); an incentive, from *Fundef*, for sub-national governments, particularly the municipalities, to increase enrolment in elementary

education, as a way of including everybody at this level of teaching, and definition of federal government's action in coordinating the national policy for promoting quality education. Indeed, in the period between 1996 and 1998 the federal government introduced a series of educational policies. In accordance with the *LDB* standards were established for the school curriculum, for the qualifications of teachers, for the setting up and production of educational statistics and the assessment of Brazilian students. Furthermore, efforts were intensified to increase decentralization of the management of programs, which until then had been managed by the *MEC*, by transferring funds to sub-national governments, such as for example the school lunch fund.

In consolidating this process, states and municipalities have, to varying degrees, sought to define viable strategies that take into consideration the content of the reform texts and laws, the political institutions and legal acts of which express the bases of this construction at the state and municipal level.

But ten years after the start of the legal, institutional and political change process that occurred in the Brazilian educational system two questions arise: what is the quality of elementary education like in the educational systems in Brazil's state capitals and which educational policies are associated with an improvement in performance?

ANALYTICAL APPROACH

Data and measures

My analysis strategy was based on an estimation of a multilevel model that considers the double hierarchical structure of the data: students within networks and networks in the years in which the *SAEB* was applied. Given the objectives proposed I consider two school performance measures: students from the 4th grade of elementary education in different years and successive generations of 10 year old children. The first measure is obtained directly from the *SAEB*. The second variable, which is particularly important because of the changes that occurred in the school flow and the social profile of the young people who have reached the different educational levels over the last few years, is not measured by the *SAEB*, which only observes those 10 year olds who are studying in the 4th grade. Because of this I used data available from various sources to estimate the performance of that part of the group not observed by the *SAEB*. The work of recomposing the proficiency of the full age group is described in Alves (2007).

In the modeling, I used the *SAEB* data for 1999, 2001 and 2003 in mathematics for the state and municipal networks of Brazilian state capital cities. Table 1 shows the number of networks and students (for the 4th grade of elementary education and for the generation).

TABLE 1
NUMBER OF NETWORKS AND STUDENTS IN THE 4th GRADE OF ELEMENTARY EDUCATION AND 10 YEAR OLD CHILDREN IN THE SAEB YEARS CONSIDERED

Year	Networks	4th grade – elementary education	Generation of 10 year old children
1999	39	2675	2604
2001	47	16,342	14,374
2003	45	8195	8133

Source: prepared by the author.

The reason for the variation in the number of educational systems and students in each year by the *SAEB* is related to the difference in its sample plan. In 1999 and 2003 the educational systems of Brazil's state capitals were not considered to be a stratum that was of interest. In order to make any analyses involving state capitals in these years, it was necessary to assume that the schools in the capital cities selected in the stratum of the corresponding Metropolitan Region are a probabilistic sample of the state capitals' schools. Starting with this assumption, it was possible to reestimate the sample weightings in order to make it feasible to carry out the analyses involving the capital cities. However, some educational systems had to be excluded from the analysis because of the reduced number of observations (for more detail, see Alves, 2007).

As indicated, in this work two dependent variables were considered: the performance of 4th grade elementary education students and the performance of children from the 10 year-old generation, both in the *SAEB* mathematics test. For each of the dependent variables models were estimated that initially had just control variables; the socio-economic level of the students and the average socio-economic level of the students in each educational system in each year. In the second stage variables related to the educational policies implemented by the educational systems over the last few years in Brazilian state capitals were included, using six analysis axes, namely: 1. school organization; 2. infant school attendance; 3. flow correction; 4. transparency and accountability; 5. autonomy of the school units, and 6. teacher training. These variables were based on indicators that allow for a comparison both between Brazilian state

capitals as well as between the networks of a same state capital. The appendix shows how the variables included in the models were constructed.

At this point, I adopted an expanded notion of policy and program, since the selection covered not only programs institutionalized by other levels of government (like the federal government's Money Direct to Schools Program – *PDDE*), but also possible action areas for federal, state and municipal governments in any given analysis axis, like the school being organized in grades or learning cycles, as provided for in current legislation. In this case, each policy or program refers to an observable dimension of each of the analysis axes proposed.

I am well aware that other policies or programs, as well as other indicators, could be used to represent the axes proposed for this analysis. In my favor, however, I would argue that my selection was based on the availability of data for the longest possible period, but mainly on the comparability of the indicators between the educational systems in Brazil's state capitals.

Values relating to the educational policies were calculated for each year of the SAEB. The analysis used a weight built from the weight of expansion, considering also the average size of the educational systems (for more details, see Alves, 2007). Figure 1 and Table 2 show, respectively, the definition and the descriptive statistics of the variables used in the estimated models[1].

[1] The varaiables socio-economic level (*NSE)*, average *NSE*, Infant education, university-educated teachers and *PDDE* were grand mean centered. The intercept, therefore, indicates the expected performance for the teaching netweorks in 1999, such as, for example, the percentage of teachers with a university education is equal to the average and the rate of provision of infant education is equal to the average. The other dichotomous variables, Municipal, Learning cycles, 9 years of elementary education, *IAS* lag, assessment and those related to procedures for choosing the principal (selection, election, selection and election, political indication and others) were not centered, which is why the intercept must be interpreted as referring to networks without attributes measured by the dichotomous variables. Finally, I would underline that the coefficients were fixed at Level 2.

FIGURE 1
VARIABLES USED IN THE MODELING

Variables	Type	Description
Dependent variables		
4th grade performance	Continuous	Proficiency in mathematics – 4th grade
Performance of the generation	Continuous	Proficiency in mathematics – Generation
Explanatory variables		
Level 1		
Socio-economic level	Continuous	Socio-economic level
Level 2		
Average socio-economic level	Continuous	Average socio-economic level of students from educational systems in each year
Municipal	Dichotomous	Indicates if it is a municipal educational system (1=yes/ 0= otherwise)
Learning cycles	Dichotomous	Indicates if the elementary education organized in learning cycles (1=Yes/ 0=otherwise)
9 years of elementary education	Dichotomous	Indicates if the elementary education offered by the educational system lasts for 9 years (1=Yes/ 0=otherwise)
Infant education	Continuous	Percentage of children from 4 and 5 years old that attends early childhood school
IAS lag	Dichotomous	Indicates if the educational system has a program for correcting the age/grade lag of the Ayrton Senna Institute [*IAS*] (1=yes/ 0=otherwise)
Assessment	Dichotomous	Indicates if the educational system has a system for assessing student performance (1=yes/ 0=otherwise)
University-educated teachers	Continuous	Percentage of groups from the educational system that have university-educated teachers
PDDE	Continuous	Percentage of schools in the educational system that receive funds from the *PDDE*.
Selection	Dichotomous	Indicates if the educational system uses selection as the way of choosing its principals (1=Yes/ 0=otherwise)
Election	Dichotomous	Indicates if the educational system uses election as the way of choosing principals (1=Yes/ 0=otherwise)
Selection and election	Dichotomous	Indicates of the educational system uses selection and election as the way of choosing its principals (1=yes/ 0=otherwise)
Indicated by politicians	Dichotomous	Indicates if the educational system uses indication by politicians as the way of choosing its principals (1=yes/ 0=otherwise)
Indicated by technicians	Dichotomous	Indicates if the educational system uses indication by technicians as the way of choosing its principals (1=yes/ 0=otherwise)
Others	Dichotomous	Indicates if the educational system uses other methods as the way of choosing its principals (1=yes/ 0=otherwise)
Level 3		
1999	Dichotomous	Indicates the 1999 *SAEB* assessment (1=yes/ 0=otherwise)
2001	Dichotomous	Indicates the 2001 *SAEB* assessment (1=yes/ 0=otherwise)
2003	Dichotomous	Indicates the 2003 *SAEB* assessment (1=yes/ 0=otherwise)

Source: prepared by the author.

TABLE 2
DESCRIPTIVE STATISTICS OF THE VARIABLES USED

Variables	Average	Dp	Min.	Max.
4th grade performance	170.80	38.62	59.84	349.04
Generation performance	168.31	39.43	67.24	349.04
Socio-economic level – 4th grade	0	1	-4.29	5.23
Socio-economic level – generation	0	1	-4.19	4.95
Average socio-economic level – 4th grade	-0.12	0.41	-1.03	0.87
Average socio-economic level – generation	-0.17	0.40	-1.08	0.87
Municipal	0.50	-	-	-
Learning cycles	0.44	-	-	-
9 years of elementary education	0.24	-	-	-
Infant education	0.36	0.15	0.06	0.94
IAS lag	0.10	-	-	-
Assessment	0.15	-	-	-
University-educated teachers	0.58	0.26	0.05	1
PDDE	0.69	0.16	0.27	1
Selection	0.05	-	-	-
Election	0.45	-	-	-
Selection and election	0.10	-	-	-
Indication by politicians	0.06	-	-	-
Indication by technicians (reference)	0.24	-	-	-
Others	0.11	-	-	-
2001	0.33	-	-	-
2003	0.33	-	-	-

Source: prepared by the author.

Even though a national assessment has significant limitations when it comes to investigating cause and effect (Franco, 2001), it is undeniable that, by and large, the assessment data offer a still unequalled opportunity for empirically investigating the consequences of educational policies and practice.

RESULTS AND DISCUSSION

Table 3 shows the coefficients of the estimated models with just Level 1 and Level 2 controls. The results are compatible with the sociological and educational investigation that accepted the importance of the role that social origin variables play in explaining the school performance of pupils. It is worth emphasizing that the magnitude of the socio-economic level coefficient in the model for the grade (π_{1jk}=3,12) is lower than national literature generally indicates, since the social conditions of pupils who attend the different educational systems in a same state capital are less variable than analyses that involve the whole of Brazil. A significant association is noted between the

variable "Average socio-economic level" and the increase in pupil performance (β_{01jk} = 13). This result indicates that a large part of the differences between the educational systems is related to the conditions of the networks themselves, represented here by the average socio-economic level of their pupils. The results show that the average performance of the networks in 1999 was 173.7. Between 1999 and 2001, the average performance of the educational systems fell on average by 6.07 points (γ_{001}) and between 1999 and 2003 by just 1.7 points (γ_{002}).

TABLE 3
MULTILEVEL MODEL OF THE PERFORMANCE IN MATHEMATICS OF THE 4th GRADE IN ELEMENTARY EDUCATION AND OF THE GENERATION OF 10 YEARS OLD CHILDREN FOR PUBLIC TEACHING NETWORKS IN BRAZILIAN STATE CAPITALS

	GRADE Model 1	GENERATION Model 2
Fixed effects	Coefficients	
Level 1		
Socio-economic level (π_{1jk})	3.12***	4.00***
Level 2		
Average socio-economic level (β_{01ik})	13.00***	17.86***
Municipal (β_{02j})	-0.41	-0.46
Level 3		
Intercept (γ_{000})	173.71***	167.59 ***
2001 (γ_{001})	-6.07**	-1.30
2003 (γ_{002})	-1.71	1.42
Random effects	Variance	
Level 1 (e_{ijk})	1198.7***	1341.0
Intercept (r_{0ik})	49.88***	54.26
NSE (r_{1jk})	20.10***	21.66
Intercept/average NSE (u_{01})	0.52	8.36
Intercept/student NSE (u_{10})	0.005	0.013

+p≤.10;* p ≤ 0.05; **p ≤ 0.01; ***p≤ 0.001
Source: prepared by the author.

I must also comment on the change in the coefficients associated with the variables "student socio-economic level" and "the average socio-economic level of the educational systems in the generation model". As can be seen in Table 3, the estimated coefficients are greater than those obtained in the grade model. This result indicates that the grade data based model underestimates the relationship between socio-economic level and performance, precisely because selection caused by failing affects pupils coming from a lower socio-economic level in a more profound way. Another aspect to be emphasized is that the average performance in 1999 was 167.59 and the coefficients associated with the years 2001 and 2003 are smaller than in the grade model, indicating

that part of the fall seen in the SAEB is due to the change in the social class composition of the students[2].

An initial analysis of the performance of the educational systems of Brazilian state capitals shows major dissimilarities between them. A closer look indicates that after adjusting the performance for the socio-economic conditions of the pupils and the educational systems the differences, even though smaller, still persist. This raise a question: what factors explain these differences? The analysis continues with the specification of models with the inclusion of variables related to the Level 2 educational policies. Table 4 shows the results of the estimated models for the 4th grade and for the generation of 10 year-old children.

TABLE 4
COMPLETE MULTILEVEL PERFORMANCE MODEL IN MATHEMATICS OF THE 4th GRADE OF ELEMENTARY EDUCATION AND OF THE GENERATION OF 10 YEARS OLD CHILDREN FOR THE PUBLIC EDUCATIONAL SYSTEMS OF BRAZILIAN STATE CAPITALS

	GRADE Model 1	GENERATION Model 2
Fixed effects	Coefficients	Coefficients
Level 1		
Socio-economic level (π_{1ik})	3.10****	4.00****
Level 2		
Average socio-economic level (β_{01ik})	14.44****	18.79****
Municipal (β_{02i})	-0.38	-0.52
Learning cycles (β_{03i})	-3.60***	-2.20*
9 years of elementary education (β_{04i})	-1.72	-1.70
Infant education (β_{05i})	9.33**	14.69****
IAS lag (β_{06i})	0.23	1.28
Assessment (β_{07i})	1.40	3.43*
University-educated teachers (β_{08i})	5.73**	7.08***
PDDE (β_{09i})	5.28	5.93
Choice of principal (rel. indication by technicians)		
Selection (β_{010i})	3.20	4.07
Election (β_{011i})	1.37	1.89
Selection and election (β_{012i})	6.31***	6.77***
Indication by politicians (β_{013i})	-1.13	-1.73
Others (β_{014i})	-1.90	0.39
Level 3		
Intercept (γ_{000})	176.0****	169.62****
2001 (γ_{001})	-7.49****	-4.19***
2003 (γ_{002})	-5.09***	-4.27***
Random effects	Variance	Variance
Level 1 (e_{ijk})	1198.32****	1340.87****
Intercept (r_{0ik})	36.61****	34.01****
NSE (r_{1jk})	20.19****	22.10****
Intercept/average *NSE* (u_{01})	0.52	8.36*
Intercept/student *NSE* (u_{10})	0.005	0.006

[2] A more all-embracing consideration on the compositional effect in the evolution of student performance in the *SAEB* years can be found in Alves (2007).

+p≤.10;* * p ≤ 0.05; ***p ≤ 0.01; ****p≤ 0.001
Source: prepared by the author

Generally speaking, the effects associated with most of the educational policies implemented by the educational systems of Brazilian state capitals in these two models are very close. This is the reason why I discuss the grade model in details, highlighting in the final section the differences between the two.

Table 4 also shows the negative, albeit not significant relationship between belonging to the municipal network and school performance (β_{02j}=-0.38). In the analyses involving Brazil as a whole, the result usually found is a statistically significant difference in favor of the state networks. In the context of the decentralization of enrollment some sectors indicate a degree of differentiation, particularly as far as the financial and administrative capacity of state and municipal governments is concerned (Andrade, 1996; Souza, 2001). This line of argument is appropriate when comparing very different municipalities, some of which are small, relatively poor and have limited technical capacity.

In the case of analyses involving state capitals, the work of Torres et al. (2006), following a different analytical approach, is more in line with the situation they investigated. The authors show how the different choices made by the managers of different educational systems have a particular impact on the degree of access to educational services. The results indicate that there is a great difference when the type of school system is observed (if municipal or state) with regard to the conditions of access to educational services and equipment.

The São Paulo municipal system used to emphasize policies relating to access to a series of services and equipment associated with general aspects of social policy, like the offering of snacks and uniforms. The state network, on the other hand, favored investments that related to a strictly educational agenda, like the time of permanence of the pupils in school. Studies of this nature are particularly relevant given the autonomy of the educational networks for defining their own policies with regard to the conditions under which they supply teaching. Over and above the individual characteristics of the governor, mayor and secretaries who were in office at the time, the result of Torres et al. (2006) suggests that the particular way in which managers deal with popular demands and how this is reflected in the structure of expenditure and access to public rights and services should also be considered.

Since the 1980s, various authors have emphasized that the 'municipalization' of education is a measure that would contribute to an increase in social control over educational activities, because mayors and municipal education secretaries are close to the population and civil society institutions, which would tend to increase the transparency and efficiency both of the investments and of the policies, as well as to bring them into line with the real needs of the population, contributing to an improvement in education (World Bank, 1992). The result of the work of Torres et al. (2006) suggests that the discussion about 'municipalization' and social control failed to consider that greater proximity of managers to the population might engender mechanisms that favor meeting urgent demands that are sometimes more in tune with general aspects of the social action policy than with the specifically educational agenda. It is important to study this in greater detail. Even so, it is also important to mention that in a one-off estimate there was a fall in the performance of the Sao Paulo municipal network after more emphasis was laid on social action via the educational policy. Even though this result needs to be looked at with a certain degree of caution, because the sample size in each municipality is not very large, I must also mention that the drop in performance in the Sao Paulo municipal network was subsequently detected by the Brazil Exam.

Choosing a school principal, assessment and financial autonomy

With regard to the process for choosing the school principal, a joint analysis of the variables that represent the various options for choosing the principal shows that there is a direct association between more democratic processes, especially the mechanism that links the aspect of meritocracy with election, and improved performance in the educational systems. In most states and municipalities in Brazil the choice of school principal used to be a prerogative of politicians. Over the last twenty years or so, one of the advances in the school democratization process has been an increase in the number of experiences of choosing the principal by election, involving not only professionals from the school but often people from the community where the school is located.

Within the context of those educational policies, the aim of which is to turn the school into an autonomous unit, the way in which the principal is chosen (by political indication, by public admission exams, by election or by mixed schemes) has a relevant

influence on the greater or lesser degree of democracy in the principal's subsequent management style, the greater or lesser acceptance by the group, and the interests to which he/she will be committed (Paro, 1998). Given the specific aspects of school organization, some authors (Teixeira, 1988) have pointed out that the electoral process has not been sufficient to avoid the continuation of 'clientist'[3] attitudes. The adoption of a scheme for choosing principals by means of selection and election has grown among the educational systems of Brazilian state capitals. This has made to a certain extent assessment of technical competence and academic background compatible with electoral processes that try to measure the principal's administrative experience and leadership capacity.

In the estimated model only the process involving selection and election had a significant effect: those educational systems that implemented this way of choosing school principals had, on average, an increase of 6.31 points in student performance when compared with networks whose choice of principal is carried out by the indication of technicians. Even though the estimated coefficients for the other choice procedures were not statistically significant compared to the choice by technicians from the Department of Education, I must highlight the negative individual estimate for the variable "direct choice by politicians".

The coefficient of the variable related to the "transparency and accountability" axis showed it was associated with a non-significant increase in student performance. One of the topics on the educational policy agenda is the need to use the results of external assessments for improving learning in schools. At the nub of this discussion is the theme of accountability, defined as being a policy whereby information about the work of schools is made public and the managers and other members of the school team are made co-responsible for the performance level achieved by the institution. In Brazil, the discussion about implementing accountability policies as a way of improving the quality of education is still in its early days. In the United States and England, within the context of reforms aimed at improving education, accountability experiments have been in force since the 1980s. Studies carried out based on the American experience indicate that there have been improvements in the results of students, although there has been no consensus as far as these results are concerned.

[3] "Clientelism" (a word derived from 'clientele') is a sub-system of political relationship, where an analogous relationship to the one established between suzerains and vassals during feudalism takes

Carnoy and Loeb (2004) confirm that the performance of Texan students in local and national exams improved throughout the 1990s, after implementation of a system of accountability. The study also shows that the more explicit is the relationship between results and consequences the greater is the increase in performance in mathematics in the 8th grade. For the 4th grade, on the other hand, the increase is especially large when black and Hispanic students are considered. Jacob (2002) examines the impact of implementing an accountability policy in public schools in Chicago and notes that there was a significant increase (around 20% of one standard deviation) in the performance of students. The indicator of the percentage of schools from the educational systems that receive funds from the *PDDE*, related to the Autonomy and School Units axis, also indicated that there was a positive association with the performance of students, but it was also statistically significant.

A joint analysis of these three topics (choice of principal, financial autonomy and assessment) refers back to the discussion about autonomy with social control. The work of Barros and Mendonça (1998) assesses the impact of introducing financial resource transfers, the election of principals and the introduction of school boards on the academic performance of pupils in Brazilian states. Three educational performance measures were used: a) the failure rate; b) the proportion of children out of schools and lagging, academically; and, c) school performance indicators. The authors point to how complementary these three policies are, evaluating the impact on educational performance for each one of them, individually and jointly. The results indicate that, jointly, the three policies explain nearly half of the educational performance improvement that occurred in Brazil throughout the 1980s. However, despite evidence that such policies have some impact, there is also evidence that it is a modest one, a finding that is in line with other results presented in this article.

Early childhood education

The variable "Infant Education" is associated with greater pupil performance: the increase of 10 percentage points in the rate of attendance in early childhood education causes an average increase of 0.93 points in academic performance. The

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place, so thar a person receives patronage from another, in exchange for political support.

results also show that attendance at a kindergarten is associated with an increase of 9.3 points on the *SAEB* scale.

International and Brazilian research indicates that access to early childhood education has a positive effect on the performance of pupils in proficiency tests and in non-cognitive behavioral skills, like attention span and discipline (Carneiro, Cunha, Heckman, 2003; Heckman, 2005; Araújo, 2006; Klein, 2006; Curi, Menezes-Filho, 2006).

The study by Araújo (2006) shows that, on average, children in Brazil who start their studies in their pre-school years perform better academically. Furthermore, the author highlights the fact that the vast majority of pupils who started studying after 1st grade of elementary school do not reach the 3rd grade in high school, given the high rate of school failure in this group. Based on data from the 2003 SAEB, Klein (2006) shows that even after controlling the socio-economic level of the pupils, there is a positive association between performance in mathematics and the fact that the 4th grade pupil had been to a pre-school group or nursery school.

The work of Curi and Menezes-Filho (2006), which analyses data from the Standard of Living Research (*PPV)* for 1996 and 1997 and from the 2003 *SAEB*, points to the positive impact of childhood education on level of education, salary and proficiency. The authors show that, on average, the individuals that frequented a nursery school or pre-school group completed more years of study than individuals who started studying when they were 7 years old, or more. Furthermore, the salary of people who started studying between 4 and 6 years old is, on average, greater than that of other people. Finally, the study indicates a positive and significant relationship between the academic performance of pupils and when they started studying: those who started in a nursery school or in a pre-school had, on average, a better performance than those who started studying only from the 1st grade of elementary school.

Over the last few years, expanding the supply of childhood education has been gaining ground in discussions on the Brazilian political agenda. With the approval of the Basic Education Maintenance and Development Fund (*Fundeb*), childhood education was able to count on a funding policy that had been hitherto non-existent. The results obtained are compatible with national literature, which points to the positive association that exists between attending childhood education and educational performance. However, the efficiency of childhood education is still an open issue. International studies show that the education of children from zero to 6 years old can be

considered one of the best social investments that exists: the younger the age of the person being educated, the higher the return of the educational investment for the individual and for society (Heckman, 2005).

However, expanding access to childhood education is also related to the idea of guaranteeing the right of all children to education and making sure that they receive it, since enrollment at this age is not compulsory: the duty of the State is only to offer places to all those who want to take advantage of them.

Teacher training

The variable that indicates the "Teacher Training" axis (teachers with a university degree) has a positive and significant impact on the average performance of the educational systems. An increase of 10 % points in the proportion of groups with teachers who have a university education increases the average performance of the educational systems by 0.57 points.

The results of international and national investigations into the impact of the education level and salary of the teacher on the performance of the students are not convergent. They are scattered, the magnitude of their effects is relatively small and in most of the research they have no statistical significance (Hanushek, 1996).

In Brazilian literature Albernaz, Ferreira and Franco (2002) reported a positive effect arising from the level of teacher training on academic effectiveness, in a study based on data from the 1999 SAEB. Convergent results were found by Soares (2004), and Machado (2005), studying, respectively, the school performance of students of 8th and 4th grades of elementary school, through data taken from SAEB 2001and 2003.

In many countries, the level of education of the teacher has no impact on the performance of pupils. The reason is that there is no variation: practically all schools have teachers with a level of training that is suitable for the teaching demanded by legislation. In Brazil, we still have a large variation in the teachers level of training, particularly when the educational systems of the different regions are considered. This may explain the results reported here.

Age/grade lag

The variable that indicates the "Flow Correction" axis (the presence of the Ayrton Senna Institute's age/grade lag correction program) has a positive but not significant impact on the average performance of educational systems. In the networks of those Brazilian state capitals that are partners of the Ayrton Senna Institute, there was an expressive decrease in the rates of age/grade distortion, thus characterizing a change in the composition of the students assessed by the *SAEB* over the years. As a result, the issue of the association between academic performance and flow correction is dealt with in a more suitable way in the generation model.

School organization in learning cycles and nine years of elementary education

The indicators relating to the "School Organization" axis present a negative association with the average performance of the educational system. The estimated value of the coefficient associated with the nine year duration was negative and not significant (β_{04j} = -1.72). The average performance of the educational systems that organizes the school in learning cycles is, on average, 3.6 points below educational systems organized by grade.

Some studies investigate the impact of the implementation of the learning cycle regime on educational indicators using different analytical approaches. The study of Ferrão, Beltrão and Santos (2002) explored the repercussions resulting from the way the school was organized on the reading and mathematical proficiency of students in the 4th grade of elementary education. The results indicate that there is no statistically significant difference between proficiency and organization into grades or learning cycles.

The work of Menezes-Filho, Vasconcellos and Werlang (2005) evaluated the impact of cycle policies on performance in reading and mathematics in the 4th grade of elementary education. To do so, they examined data from the 2001SAEB of state educational systems and came up with results similar to those of Ferrão, Beltrão and Santos: there is no statistically significant impact on academic performance when the school adopts organization in learning cycles, despite the fact that the isolated estimate of the coefficient of the "learning cycle" variable was negative.

The study of Fernandes (2003) compares the social context, school conditions and the understanding of the teachers who worked in schools organized in grades and in learning cycles, considering the answers given by principals and teachers to the 2001 SAEB questionnaires. The author showed that the social context in which the policy of learning cycles is implemented is frequently marked by difficult situations, involving high levels of violence, theft and vandalism in schools, as well as great difficulties in teaching conditions, particularly related to the lack of stability in the teaching staff. The work also indicates that those teachers who worked in schools organized in learning cycles proved to be more prepared to take risks and responsibility for the students' learning than teachers from schools organized in grades.

Despite Brazilian research showing a negative association (frequently not significant) between school organization in learning cycles and student performance, it is important to point out that the implementation this form of organization in various educational systems has caused a marked drop in the rates of failure over the last few years. According to various investigations, this is unequally distributed between students: the probability of repeating a year is greater among pupils who have more disadvantages, both economic and social (Alves, Ortigão, Franco, 2007; Alexander, Entwhistle, Dauber, 1994). Franco, Albernaz and Ortigão (2004) found a similar result when working with *SAEB* data. Pupils who repeated at least once showed, on average, an approximately 24 point poorer performance (nearly a 0.5 standard deviation from the performance distribution). Faced with recognition of the drastic consequences of failure, as well as the ones generated by age/grade distortion (an increase in costs, a fall in performance levels and academic failure), it is important that the discussion about whether to introduce, or not, an organization into learning cycles goes beyond its association with academic performance. This argument gains weight when we analyze the effect of implementing learning cycles, considering performance and school flow jointly.

The effect associated with "organization into learning cycles" is less on the generation model than on the grade model. This is what is expected: in the first model, the effect associated with organization into learning cycles means that an educational system thus organized loses, on average, 3.6 points in student performance, when compared with an educational system with grades. However, it is already known that in the performance of pupils of the 4th grade of elementary education, a greater failure rate leads to greater selection and better performance. As this situation is more prevalent in

graded organizations, the effect associated with the learning cycle is greater in the grade model, because networks that are not organized in the former way create greater obstacles to the pupils reaching the 4th grade. We can see that in the generation model the coefficient for the "learning cycle" variable is only marginally significant at 10%, unlike what happened in the model for the 4th grade of elementary education.

Analogously, the increase in the estimated coefficients for the variables related to providing childhood education, to establishing an assessment systems and to the percentage of university-level teachers in the generation model suggests that more frequently occurring positive policies are employed in educational systems in which failure is less frequent, which is why the coefficients associated with these policies were underestimated in the model based on grade data.

FINAL CONSIDERATIONS

The results obtained indicate that the educational policies associated with the increase in the performance of students from the educational systems of Brazilian state capitals are related to the processes used in the meritocratic and democratic choice of their principals, to financial autonomy, to the introduction of assessment systems, to the supply of childhood education and to the fact that their teachers have a university-level education.

The effect of some of the educational policies on the performance of the generation was greater than on that of the 4th grade of elementary school, indicating an association between educational systems in which fewer students fail (consequently there is less selection of students) and the implementation of these particular educational policies. It is worth mentioning that the difference between the grade and generation models would be even greater for the assessment of policies at the national level: in Brazil as a whole the variation in social composition due to selection because of failure is much greater than in the Brazilian state capitals.

As I have already mentioned, in this work I have used the concept of educational policy in a topical way, referring only to situations relating to the programs or areas of operation that are implemented by the managers of the educational systems. Despite the effort to construct variables that capture the educational policies, I was only able to consider a limited number of them. Even so, the models presented in Table 4 explained 72% of the variance in the average performance of educational systems.

Despite the statistical significance of the estimated coefficients for the educational policy variables, the size of the coefficients is relatively small, especially when contrasted with the size difference in the educational performance of Brazilian students and the performance obtained by students from other countries in international assessments (Unesco/OECD, 2000).

A similar conclusion about the small magnitude of the estimated coefficients, given the challenges when it comes to providing quality education, may be obtained from an interpretation of the *SAEB* scale. The median student from the 4th grade of public elementary education in Brazilian state capitals has a performance of almost 175 points on the *SAEB* scale, a proficiency which is considered by the specialists in mathematical education as being below adequate for consolidating the skills needed for the pupils to continue studying and taking full advantage of their studies.

On the *SAEB* performance scale, this result of the median pupil corresponds to solving everyday problems that involve the addition of rational numbers with the same number of decimal places, the calculation of the result of an addition and subtraction with numbers that have up to three digits and one digit multiplication (MEC/Inep, 2002). The median pupil from public school in state capitals is behind as far as concerns the mathematical skills considered to be fundamental for pupils who are finishing the first half of elementary education, such as the solving problems that imply the notion of proportionality or problems that associate more than one operation in situations relating to the monetary system. On the *SAEB* scale these skills are at least 50 points ahead, which correspond to approximately an increase of one standard deviation of the national proficiency distribution. The modest contribution made by educational policies to the increase in performance of the educational systems of Brazil's state capital cities indicates that none of these educational measures is capable of increasing the performance of pupils by the magnitude that is necessary.

These policies are dear to the hearts of academics and educational managers who started having a greater influence on the educational policy when the redemocratization process in the country started. There is still room for advances in this educational policy agenda – more pre-school, better qualified teachers, more assessments, greater autonomy of the school units and better ways of appointing principals – but the results indicate that the challenge of providing quality education cannot be faced up to without profound changes in the agenda.

After the period between the end of the 1980s and the end of the 1990s, in which there were considerable improvements in Brazilian education, at least with regard to the aspects of access and flow, the contemporary scenario is not very promising. Flow stopped improving many years ago, and there are signs that the failure rate is increasing, access to high school is not rising and the quality indicators hover between a small improvement and a small deterioration (depending on the methodology used to treat the data), but always at a quality level that is extremely low.

In this context, besides pursuing the introduction of the best measures from the traditional agenda of educational policy, it is necessary to include topics that are frequently, *a priori* ignored and forbidden because they are aligned with political ideas that are considered to be of a neo-liberal hallmark (e.g. Gentilli, 1996). Going beyond any philosophical and party-political affiliation, these themes need to be discussed in the light of national and international experience. Brazil is undoubtedly a very diverse and complex country and it is not a matter of prescribing for the Brazilian context policies that have proved to be effective in other contexts. However, the very complexity and diversity of the Brazilian reality demands greater innovation, and scope as well as evaluation of the educational policies being practiced.

Brazilian education is, after all, entering the 21st century in a very difficult situation. At the same time, educational systems from various countries are managing to improve their results considerably, supported by policy agendas that are very different from those that are commonly practiced in Brazil (Jacob, 2002; Carnoy, Loeb, 2004). The possibility of diversification in the educational policies practiced in Brazil depends on the capacity of academics, managers and politicians to consider, in an unprejudiced way, themes usually held to be difficult, such as the accountability of managers and teachers for the results achieved in the schools, the adoption of more radical autonomy patterns than those practiced here, of more structured curriculums, as well as other aspects that are associated with positive results in other contexts. It is undoubtedly positive that some measures in the country point to the possibility of an opening up to a renewal of the policy agenda.

Recently, the construction of the Basic Education Development Index (*Ideb*) per school and per educational system in each municipality increased the visibility of the accountability policies already existing at the state and municipal level (Brooke, 2006). To the extent that between 1995 and 2005 *Ideb* only suffered small oscillations, the current actions of the federal government, like the Education Development Plan (*PDE*)

and the establishment of targets to be reached by 2022, need to be discussed in the light of policies that can make a difference in terms of the quality of education.

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APPENDIX

Variable	Description
NSE	Constructed using a questionnaire for pupils of the SAEB, including the following items: number of rooms, bathrooms, number of radios, having a refrigerator, video player, washing machine, computer, the number of TVs, automobiles and maximum educational level of the family (obtained from information about the educational level of the pupil's father and mother). A measure of the socio-economic level of pupils obtained via the *TRI* [Item Response Theory]. Source: *SAEB*.
Learning cycles	Percentage of schools organized in learning cycles, in grades or in both in each of the educational systems of Brazilian state capitals. Subsequently, I checked if the cycle included the 4th grade of elementary education. With this information I built an indicator with the following codes: 0 = Organization in grade and 1 = Organization in learning cycles. Source: School Census.
9 years of elementary education	Percentage of schools with 8 and 9 years of elementary education. 0= 8 years of elementary education, and 1 = 9 years of elementary education. Source: School Census.
IAS lag	Indicator of flow correction programs and the year of implementation in partnership with Departments of Education. 0 = Not implemented, and 1 = Programs implemented. Source: Ayrton Senna Institute.
PDDE	In each of the educational systems in Brazil's state capitals, the percentage of schools that stated they took part in the *PDDE*. Source: School Census.
Choosing the principal	Way of choosing the principals of educational systems in Brazilian state capitals. With this information I constructed an indicator, with the following codes: 1= Choice by selection, 0 = otherwise 1= Choice by election; 0 = otherwise. 1= Choice by election and selection; 0 = otherwise 1= Choice by technical indication; 0 = otherwise 1= Choice by political indication; 0 = otherwise 1= Other forms of choice; 0 = otherwise Source: *SAEB*
Teacher training	Based on the replies of teachers from the 4th grade of elementary education, I constructed a variable indicating whether the teacher had completed university-level education, or not. Subsequently, I calculated the percentage of groups from the 4ª grade of elementary education in the educational systems of Brazilian state capitals whose teachers have a university degree. Source: *SAEB*.
Rate of early childhood education	For calculating the percentage of four and five year old children in school the total number of children in this age band in school is divided by the total number of children in this age band. For the numerator I considered the information from the school census about the number of children of four and five years old enrolled in early childhood education, assuming that the enrolment of children of this age in elementary education is low. Due to limitations in the availability of data about the total number of children of four and five years old in Brazilian state capitals, as the basis I considered the sum of the population of children of four and five years old obtained from the Demographic Census of 1991 and 2000. To do so I calculated a correction factor to estimate the increase in the population of four and five year old children, based on the difference in the population in 2000 and 1991 divided by the number of years in the period, assuming that the rate of growth of these populations is constant for the period analyzed. Therefore, the calculation of the percentage of four and five year old children in early childhood education enrolled in official teaching establishments that respond to the questionnaire of the school census in Brazilian state capitals is equal to: Number of children of 4 to 5 enrolled in early childhood education in official establishments _____ Sum of the population of children of 4 and 5 years old Undoubtedly, the rate of attendance in pre-school in any type of establishment is greater than that captured by the indicator here described. However, given the purpose of this work and the legal definition of early childhood education as an integral part of basic education, the operational definition presented here captures an important aspect of the effort of educational systems to offer early childhood education in pre-schools.