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## MEASURING EDUCATION QUALITY IN BRAZIL



Education quality can be measured in various ways, including the analysis of learning and other outcomes in children and through the analysis of underlying services. In Brazil, a collaborative endeavor between the IDB, the Ministry of Education and the Carlos Chagas Foundation focuses on the latter. This brief details the processes and results to date.

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### Background

The Basic Law of National Education (Lei de Diretrizes e Bases da Educação Nacional) stipulates that infant education covers all children from ages 0–6, with provision to the 0–3 cohort in crèches and provision to 4–6 year-olds in preschools. This same law stipulates that infant education constitutes the first phase of basic education. With the passage of the National Policy for Infant Education passed in 2005 (Política Nacional de Educação Infantil: Pelo Direito das Crianças de Zero a Seis Anos à Educação), infant education became formally integrated into the country's education system.

A constitutional amendment passed in December 2006 reduced the infant education cohort to 0–5 years. It also established the Fund for the Maintenance and Development of Basic Education and Valuing of Education Professionals (Fundo de Manutenção e Desenvolvimento da Educação Básica e de Valorização dos Profissionais da Educação, FUNDEB), which provides for federal transfers to states and municipalities with the aim of increasing and improving the distribution of public resources allocated to basic education. Unlike its predecessor, FUNDEF (Fundo de Manutenção e Desenvolvimento do Ensino Fundamental e de Valorização do Magistério), which covered

primary education only, FUNDEB created a unified fund for the entire basic education cycle, from infant through secondary education. By increasing coverage, FUNDEB raised the federal government's commitment to basic education by about ten-fold (from an average of US\$250 million per year under FUNDEF to about US\$2.5 billion per year at present).

These changes in the legal framework were mutually reinforcing and had important consequences for infant and primary education. Responsibilities for the delivery of services at both levels fall almost exclusively to the municipalities. With coverage at the primary level all but universalized (an estimated 98% of the 7–14 year-old cohort is in school) and fertility rates falling, the federal government sought such changes in the legal framework to alleviate pressure on preschools resulting from increased demand from families anticipating entry of their children into first grade. By incorporating infant education into FUNDEB and allowing six-year olds to enter into primary school, where capacity exists to absorb new entrants, less pressure was placed on the municipalities to respond to and accommodate an ever-greater demand for preschool. These processes culminated in 2009, when a constitutional reform was passed expanding compulsory education for children aged four to 17 and thus incorporating preschool in the obligatory cycle. Municipalities have until 2016 to comply with this change and ensure sufficient supply for their 4 and 5 year-olds. <sup>1</sup>

## The Study

The study followed from these antecedents. In late 2008, financing from the Bank's Social Fund modality was approved to undertake a quantitative and qualitative study on the quality of infant education in Brazil. This study was grounded in the following hypotheses: (i) expansion in enrollment in infant education has been at the cost of quality; (ii) there is considerable variation in the quality of infant education; and (iii) quality of service impacts performance in primary education.

To test these hypotheses, primary data were collected in six large cities representing the general trends in and heterogeneity of infant education in the country: Rio de Janeiro, Belem, Fortaleza, Campo Grande, Teresina and Florianopolis. Basic data on infant education in these cities follow.

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<sup>1</sup> This is a huge challenge for municipalities, as they have to expand coverage from 80% (2008).

City	% 0–3 years in crèche	% 4–6 years in preschool
Belem	4.9	32.1
Campo Grande	31.0	30.7
Florianopolis	36.9	49.0
Fortaleza	13.2	48.2
Rio de Janeiro	22.3	50.3
Teresina	14.4	55.4

Estimated by age groups and city on the basis of data from IBGE, 2008.

## The Instruments

The research team, led by the Carlos Chagas Foundation, critically reviewed a number of international and national instruments, and adapted them to meet the purposes of this study. In the case of the centers, the team chose to adapt the revised versions of the ITERS (infant and toddler environmental rating scale) for application in the crèches and the ECERS (early childhood environment rating scale) for use in the preschools. The ITERS–R was designed for children 0–2.5 years but, in the adaptation of the instrument used for this study, it was applied to children in crèches aged 0–3. Similarly, the ETERS–R was designed for children aged 2.5–5 years, but in the version adapted for this study, it was applied to children aged 4 and 5 in preschools.

The ITER and ECER scales are observational scales and amass a significant amount of data along seven main dimensions: physical space and equipment; care routines; speaking and communication; activities; interaction; programming; and parents and childcare team. These dimensions are consistent with the much of the existing literature of quality in early education. Principal elements for which a consistent and positive impact on children and their learning trajectories has been found include: (i) highly skilled teachers; (ii) small class sizes and high adult-to-child ratios; (iii) age-appropriate curricula and stimulating materials in a safe physical environment; (iv) a language-rich environment (where emphases are placed on language acquisition and communication skills);



(v) responsive interactions between staff and children; (vi) high and consistent levels of child participation; and (vi) adequate levels of health and nutrition (Center on the Developing Child at Harvard University, 2007).

Both the ITERS and ECERS scales have been applied throughout the United States and the Organization of Economic Cooperation and Development. Notably, this was the first time that they were applied in Brazil at this scale (there have been small scale studies in the past of 1–2 centers, only).

In addition, the team drafted survey instruments for teachers and school principals to be applied in tandem with the ITERS and ECERS. For these instruments, and that for families (for the impact study), questions were generated and/or adapted from a number of sources, including the education census, the household surveys, and international tests such as the LLECE and SERCE tests that were applied throughout Latin America. In the specific case of the survey for teachers, pointed questions were included to assess the political economy of the infant education teaching profession, including issues of recruitment and contracting, training, function versus post, etc.

The instruments were piloted in Santo André, suburb of Sao Paulo, in July of 2009, and adapted accordingly. For example, rather than the enumerator administering the surveys to center staff, these staff were asked to respond and return the survey to the enumerator. This was done to save time, as the application of the ITERS, ECERS and survey to center staff required about three days. This was reduced to two.

Results of the pilot test were also used to dimension a training course for enumerators from each of the six participating cities. Data collection in each city was done by a team of local researchers comprised of the technical staff from the respective municipal secretary and the local university. The Foundation provided training to each city team at its headquarters in Sao Paulo in late July. This training largely focused on the application of the ITERS and ECERS scales.

## Sample

As mentioned above, the study applied the instruments and surveys in six cities. In each city, a sample was drawn that was stratified by socioeconomic status and institutional arrangement of service provision (private, public, *conveniada*). The Foundation prepared a matrix that contained these aspects as well as others, including whether the institution was a crèche only, a crèche attached to a preschool, a crèche and/or preschool attached to a primary school, and the number of classrooms in each. Based on this, the final sample was drawn that included 20 centers in Rio, Belem and Campo Grande and 30 in Teresina, Florianopolis, and Fortaleza. In Rio, Belem and Campo Grande, the sample included private, public and *conveniada* centers, which are operated by non-governmental organizations but receive public funding.

In Teresina, Florianopolis and Fortaleza, the sample did not include private centers, due to the fact that data for the impact evaluation would be collected exclusively in these three cities and private institutions do not participate in the Provinha (discussed below). This was a tactical decision, based in large part to contain the costs of data collection, particularly those associated with the impact evaluation of early education in primary. In all cities, the sample was limited to formal service provision, thus excluding ex-ante services (e.g.,) delivered in home- or community-based settings.

## Results

Both the ITERS-R and ETERS-R scales used in this study run from 1-10,<sup>2</sup> with ten being the highest possible score. Scores between 1 and 3 are classified as “inadequate”; 3-5 is considered “basic”; 5-7, “adequate”; 7-8.5, “good”; and 8.5-10 is “excellent.” On average, the centers surveyed in the six cities included in this study are “basic” (3.3), with Florianopolis and Rio de Janeiro scoring higher than the rest. This raises a number of concerns, foremost of which is the reality that underlies these scores remains far from complying with the country’s National Parameters for Quality.

Municipality	ITERS-R		ETERS-R	
	Average	Classification	Average	Classification
Belem	2.7	Inadequate	3.2	Basic
Campo Grande	2.8	Inadequate	3.6	Basic
Florianopolis	4.4	Basic	4.7	Basic
Fortaleza	2.7	Inadequate	2.2	Inadequate
Rio de Janeiro	3.9	Basic	3.6	Basic
Teresina	2.3	Inadequate	2.7	Inadequate
Average	3.3	Basic	3.4	Basic

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<sup>2</sup> It should be noted that the 1-10 scale was an adaptation introduced by this study, in an effort to mitigate the clustering of results at the lower end. The ITERS-R and ECERS-R scales, in their original format, run from 1-7.

Disaggregating this average into the seven sub-scales allows for a more focused analysis of different quality components.

**Sub-Scales**

<b>ITERS-R</b>	<b>Average</b>	<b>ETERS-R</b>	<b>Average</b>
Space and Furniture	Basic (3.1)	Space and Furniture	Basic (3.1)
Personal Care Routines	Inadequate (2.9)	Personal Care Routines	Basic (4.0)
Speaking and Comprehension	Basic (3.8)	Language and Reasoning	Basic (3.7)
Activities	Inadequate (2.2)	Activities	Inadequate (2.3)
Interaction	Adequate (5.7)	Interaction	Adequate (5.6)
Structure of Program	Basic (3.2)	Structure of Program	Inadequate (2.5)
Parents and Team	Basic (3.6)	Parents and Team	Basic (3.7)
Average	Basic (3.3)	Average	Basic (3.4)

“Interaction”, defined as the quality of interaction between adults and children (discipline, supervision) and the quality of interaction between children, stands out as the one area where both the crèches and preschools are adequate. This is positive, in that it is one of the principal elements consistently identified in the literature as having a positive impact on child development (see above). Notably, however, in and of itself, it is insufficient for ensuring that the overall quality of services. Considerable latitude exists for improving the quality of infant education in Brazil. Notably, where much this pending improvement needs to take place is inside centers and bears a direct relationship with the capacities of those charged with delivering services to children.



Of particular concern in both the crèches and the preschools are the “activities” – the heart of the pedagogical proposal implemented in classrooms and are thought to be essential building blocks for ensuring positive outcomes in school and later in life. For example, the lowest scores received on the ECERS-R related to activities in dramatic play and in nature and science, suggesting that few, if any, opportunities exist for children in the tested centers to explore the world around and engage in language-rich activities, the basis of learning. Similarly, in the case of the ITERS-R, activities related to using blocks, which are quite universally recognized as important for developing basic notions of number, size and problem-solving, received one of the lowest scores.

On average, the infrastructure in the crèches included in this study is “basic”, albeit with some variation. Interior spaces, the organization of classrooms, and the display of materials for children are classified as “basic”, whereas the furniture available for daily classroom activities, routines and play, and resources available for providing comfort to children appear as “inadequate.” This raises safety concerns, among others.

Integrating the results from the ITERS–R, ECERS–R and the surveys to teachers and school principals allows for a profiling of what types of centers score best and worst on the quality scales. The characteristics of the best providers follow; characteristics of the worst are assumed to be the inverse.

	<b>Characteristics of Centers Obtaining the Highest ITERS–R/ECERS–R Scores</b>
<b>Crèche</b>	Part of an establishment providing only crèche or crèche and preschool only Good infrastructure, as measured by the ITERS–R 8 or more pieces of media equipment (television, video, computer, etc.) Children have access to transportation Principal with a salary exceeding 9 times the Brazilian minimum wage No guaranteed entry for children of staff Teachers younger than 44 years At least 8 activities available to children daily (music, movement, nature, art, etc.) Located in neighborhoods where most residents had more than 7 years of schooling
<b>Preschool</b>	Part of an establishment providing only crèche or crèche and preschool only Good infrastructure, as measured by the ECERS–R 8 or more pieces of media equipment (television, video, computer, etc.) Children have access to transportation Principals who promoted in–service training Principals elected or put in place via competitive processes Principals with fewer human resources problems in the center Smaller groups of children Principals with 15 or more years of education Principal with a salary exceeding 4 times the Brazilian minimum wage Teachers with graduate certification in education, and particularly early education

In the case of the crèches, the factors listed above explain 71% of the observed difference in ITERS–R scores. Principal salaries and teacher’s age had the greatest impact, explaining 15% and 12%, respectively, of the difference. In the case of preschool, the variables wielding the greatest impact on

ECERS–R scores were principal’s salary and the type of institution, explaining 20% and 17%, respectively. About 82% of the difference in ECERS–R scores can be explained by the combined impact of these variables.

## Impact Study

MEC priorities for this study centered clearly on the evaluation of processes. To its mind, quality in early education would be best evaluated by limiting the analysis to factors falling within the purview of Ministry responsibilities, such as teachers, infrastructure, classroom practices, etc., rather than outcomes measured in children, as other factors (e.g., household characteristics) tend to wield significant impacts on such outcomes. This being the case, the impact evaluation took as its dependent variable Provinha scores. The Provinha is a 24–point literacy test administered to children in second grade in public schools. It is not obligatory.<sup>3</sup> Each municipality determines whether it will administer it or not. Provinha scores are not sent to MEC or INEP for analysis (as are other standardized tests), but remain in the respective municipal secretariat of education to provide feedback to schools. The decision to use Provinha scores in the impact evaluation stemmed from the fact that, as of 2007, all data in the education census are collected at the child level. The census captures test scores, including Provinha scores, as well as data on what preschool, if any, the respective child attended. To control for socioeconomic status, a key factor in learning, the study administered a survey to families in October of 2009.



There are many implications of this, the most important of which include the fact that the impact evaluation was not as robust as hoped and that data collected through the survey to families will need to be historical in nature (e.g., what was the main reason why you decided to

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<sup>3</sup> The 24 points can be broken down into 5 levels: 1 (up to 10 points), student recognizes some letters, syllable and sounds of letters; 2 (11–15 points), student recognizes some letters written differently, some simple words and texts; 3 (16–18 points), student can read more complex words, short sentences, and find explicit information in texts; 4 (19–22 points), student is able to show evidence of deeper understanding of text, as well as type of text; and 5 (23–24 points), student is well into the initial processes of reading and writing fluently.

send your child to preschool?) despite the fact that they will be associated with the current characteristics captured through the ECERS–R and other surveys.

There also is an issue of age–at–entry into first grade. For example, in the case of Florianopolis, a city which witnessed 10% growth in enrollment rates in for 4–5 year olds between 2008 and 2009. Not all of this growth was for preschool. As noted above, surveys to families were administered near the end of the academic year. Based on the data collected, about a third of all children in second grade at this time were younger than seven (the expected age of a second grader is 8 years), meaning that they had started primary school younger than six years. Notably, such a situation ensued prior to the legal changes in December of 2009 that expanded the obligatory cycle from 4 to 17 years. About 58% of children fell within the expected age–range, and about 5% were overage.

Several slight differences arise in the profiles of families whose children attended preschool (Families: Preschool) and those whose children did not (Families: No Preschool). It merits noting that the variables typically associated with higher rates of preschool – higher levels of education and income – are not so pronounced in this study, suggesting the strong possibility that the decision to send a child to preschool (at the time of this study, not obligatory) was based more on availability of supply than anything else.

	Families: Preschool	Families: No Preschool
<b>Father’s education</b>		
Less than High School Complete	77	79
More than High School	23	21
<b>Mother’s Education</b>		
Less than High School Complete	70	71
More than High School	30	29
<b>Family Income</b>		
Reporting at least 2 minimum salaries	75	64
Reporting more than 2 minimum salaries	23	29

## Data Analysis

All analyses focused on the impact of preschool on Provinha scores; attendance in crèches was not considered. To estimate this impact, a cross–classified, multi–lever model was used. Two levels were included: school (pre– and primary school) and students. Data were drawn from the parent survey, the school census, the population census, and the ECERS–R. The results follow.

Taking into account the effect of primary school only, the model attributes 16% of the differences in Provinha scores to the effect of the primary school and 84% to the differences between students. When the model simultaneously controls for the effect of both preschool and primary, approximately 3% of differences in second grade test scores are explained by preschool, 15% by primary schools, and 82% by differences between students.

Notably, however, focusing solely on the variation in preschool, quality explains the difference in Provinha scores. Taking the analysis a step further, the models also reveal that children who attended high quality preschools were more likely to achieve higher scores on the Provinha. The average score of these children on the Provinha was 19.3/level 4; children attending low quality preschools scored around 17.4/level 3. Seen in this light, quality of preschool does indeed matter for learning results later in school.

The results also clearly indicate that the most all differences in Provinha scores are due to differences between children. These differences include levels of family income and parental education and repetition of first grade. Yet they also speak to the age of the child at second grade. Children in second grade are expected to be 8 years of age. Those who are 8 years, score considerably better than younger children, thus signaling what some consequences could be of the new changes lowering age-of-entry to primary school.

## Conclusion

The results of this study indicate that considerable work remains to be done in improving the quality of infant education in Brazil. Even the best centers included in this (albeit limited) sample require some level of improvement, as the quality of service received early on influences what a child learns and achieves later in school. Efforts need to focus in particular on children from poorer socioeconomic strata, as it is in these populations that high quality infant education could have the longest and most lasting effect. The human resources base underpinning delivery of infant education requires sustained attention as well. At present, the infant education teaching force has, on average, the lowest level of training (completed secondary education is the requirement to enter the teaching force) and there is considerable suspicion of irregularities in contracting, payment and duties performed (e.g., teachers contracted by means other than official contracts, payment of ghost teachers, instances where functions are different than they should be for the given post, etc.).

Efforts to improve the quality of education for the youngest learner are ongoing from all levels of government. These challenges outlined here have been acknowledge by MEC and the municipal education secretariats participating in this study. It is hoped that more work will continue in the direction laid out here and, with the new administration, the attention to infant education will be sharpened and deepened.

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