



The effort for egalitarian rights on education in Brazil: a statistician's look

STS024 - The Use of Statistics in Human Rights, Humanitarian,
and Developmental Projects World-Wide

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Abstract

Brazil is now 85% urban, still coping with vast social inequalities: it was the last country in the Americas to ban slavery (1888). Since 1995 the democratically elected governments have been implementing consistent affirmative action measures, however the advances are slow. The gap in educational opportunities between social classes is a main bottleneck for the country's development. Efforts, both from government and civil society are being made to overcome this gap. A consensus emerged that it is not enough to provide public schools coverage. There is a need to improve the quality of learning. We describe the five goals of the NGO "Todos pela educação" (All for Education). We compare the situation in the years 2007 and 2015 for the goals 1,2,4 using PNAD data (National Household Sample Survey) and for goal 3, using SAEB (National System Evaluation of Basic Education), 2005 and 2015. Finally, we present three small scale NGO initiatives, Illeca, Ismart, and Vidigal Art School.

Keywords: educational evaluation; universalization, quality of education, non government organizations.

1. A dream postponed: the "Escola Nova" (New School) movement

In May 13 1888 slavery was abolished in Brazil by the monarchy. Aid to the freedmen was planned, but next year the military established the Republic - help did not come through. A recent study gives some evidence that a demand of ex-slaves and poor whites was education for their children [1]. Illiterates were not allowed to vote until 1988¹.

Industrialization of Brazil started in the Vargas era, from the early 1930's to the end of WW2. Important Ministries were created, specially labor, and education and health². Intellectuals and artists from that generation, irrespective of ideologies and creed (Portinari, Villa Lobos, Drummond, Bandeira, Gilberto Freire, Mario de Andrade, among many others) had the vision of a fraternal mix of races, powered by a strong public school system promoting nationalistic values ([2], ch.2). A manifesto for the New Education was led by Anísio Teixeira and Fernando de Azevedo in 1932³. A singular voice in that period was Teixeira de Freitas, who struggled in vain for the use of measurements, as a tool for universalization and quality of education. At that time only 65 % of each cohort had access to school at those times. Moreover, only three years of education was mandatory, with a high repetition rate [3,4,5].

¹Women were allowed to vote after 1932, but the first opportunity came in 1946.

²Science, however, started to have government help (with ups and downs) only after 1948, with the creation of CNPq (Brazil's NSF) resulting on a quite competent scientific basis. The economy, however, has not been able to fully use the scientists capability.

³cpdoc.fgv.br/producao/dossies/JK/artigos/Educacao/ManifestoPioneiros. The manifesto proposed that the State should organize a general education plan and defended the banner of public, secular, compulsory and free school.

2. “Todos pela Educação” (All for Education)⁴ movement: making the dream possible?

Until 1960 Brazil was mostly rural, 54% of the population. In the last six decades urbanization was brutal, specially during the military regime (1964-1985). Rural population was 30% in 1985, and further dropped to 14% of a population of 200 million in 2015⁵.

Until 1995, public policy consisted only in increasing enrollment. In 1995, emphasis shifted beyond putting all children in School and evaluations started, bringing to the fore the issue of quality of learning. The evaluations show that, although more children are finishing the three segments, the quality remained stable.

Starting in 2006, “Todos Pela Educação” is a wide spectrum movement, including leading businessmen⁶. TPE mission is to engage both public power and the Brazilian society to deliver the right of ALL children and young people to a Basic Education of quality. For the first time, it was discussed and defined what is needed to have an education of quality [6]. The goals of the movement are synthetised as follows, and their assessment is the purpose of this presentation⁷.

Goal 1. Every child and youngster from 4 to 17 years of age should be at school.

By the year 2022, 98% of children and youngsters between 4 and 17 years old must be enrolled and attending school or have already completed high school.

Goal 2. Every child should be fully literate at age 8. Math literacy as important as reading.

By 2022, 100% of the children should have the basic reading, writing and mathematics skills at age of 8 or by the end of the 2nd year of Elementary School.

Goal 3. Every student with learning appropriate to his or her school year.

By 2022, 70 % or more of students will have learned what is right for their grade.

Goal 4. Every 19-year-old with high school completed.

By 2022, 95% or more of 16-year-old Brazilians should have completed Middle School and 90% or more of Brazilians aged 19 or older should have completed High School.

Goal 5. Investment in Education is well-managed and expanded.

By 2022, public investment in Basic Education should be 5% or more of the Gross Domestic Product (GDP).

The statistics presented below (tables generated by the authors) indicate that for Goal 1 - enrollment, there were advances, and the tendency seems positive. The third table indicates that for all household income quartiles, and irrespective of sex and color, from 6 to 14 years, 98% or more of the children are at school, but as seen by Goal 4, not all finish middle school. Table 2 show a great progress for the 4-5 year olds and probably in the next few years, we will have 98% in school. The main problem occurs in the age range 15-17, even in the higher household income quartile - see for instance the 91.85 figure in the fourth table of Goal 1. Unfortunately, despite some progress, there is still a lot to be done to achieve Goals 2 to 4. Girls outperform boys in all social classes, since alphabetization, and more so as schooling advances. See Goal 4 tables, that describe completion with at most one year of delay. The completion rate, irrespective of number of repetitions, is about 10 percentage points more. In conclusion: completion of the EM - Ensino Médio (high school in USA) in all quartiles need a lot of improvement. This brings to the fore a fundamental question, being discussed nowadays: a common Basic Curriculum for every student in all grades and its implementation, an important step in the struggle for quality education.

⁴<https://www.todospelaeducacao.org.br>

⁵<http://data.worldbank.org/indicator/SP.RUR.TOTL.ZS?locations=BR>

⁶Whose interest may not be egalitarianism, but they are interested in quality to make the economy more efficient.

⁷TPE promotes also flags and attitudes. Flags: 1. Improvement of teacher training and career; 2, Definition of learning rights; 3. Use of assessments to correct pedagogy; 4. Extending the offer of integral (full time) education; 5. Improving governance and management.

3. The EM Reform. Another discussion is what a high school should be in Brasil. The same for all, or with different paths? A curriculum reform was recently approved by the Congress, with option on employability. Discussing the changes goes beyond the scope of this paper. Although the reform offers professionalisation opportunities, it is facing reactions. The Movement All for Education has a moderate view, calling the attention to the good points of the law, however stressing that the implementation must be done with care⁸.

4. Three NGO initiatives to support children of low income families

Although 98% or more of the children between 6-14 years are at school, and starting 2016, all children should be attending preschool at age 4, basic issues, like repetition are still unresolved. Social problems, like violence, deeply affect education in low income areas.

Initiatives are appearing all over the country to help, with different approaches, children of those low income families. Unfortunately, all face Sophie's choice: helping a few out of many. They are important tools of society engagement, nonetheless. We mention two initiatives and we will discuss them during the Panel. We urge the reader to look at their sites, <http://www.ismart.org.br>, and <http://www.ilecca.org.br>.

While Ismart gives fellowships to talented students from low income families to study in elite private schools, Ilecca offers after school help during the elementary school cycle - allowing the attending children to pass the entrance exam to a few differentiated public schools, usually run by the Federal Government, that still provide a high quality learning.

We also call attention to the Art School that artist Vik Muniz just opened in the Vidigal Community of Rio de Janeiro, <https://brazilfoundation.org/project/escola-do-vidigal/>.

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Ruben Klein's involvement with Civil Society includes: President of the Brazilian Association of Statistics (ABE), August 1990 to August 1992; President of the Brazilian Association for Educational Evaluation (ABAVE), January 2012 to January 2016. Member of the Movement All for Education since 2006, Member of the Movement for the Common National Basic Curriculum since 2014.

Jair Koiller's involvement with Civil Society includes: Espaço Ciência Viva co-founder, 1982. Active, in several periods, on Scientific Societies such as SBPC, SBM and SBMAC (Brazilian Mathematical Societies). Coorganizer of the Math for Peace and Development School, satellite to ICM2006. Participated in International Campaigns for Scientists imprisoned because of political activism, 1980's.

⁸<http://www.todospelaeducacao.org.br/reportagens-tpe/39725/nota-do-todos-pela-educacao-sobre-a-mp-do-ensino-medio/>

Socio-economic data (PNAD)

The Brazilian Institute of Geography and Statistics (IBGE) National Household Sample Survey (PNAD) provides, every year, general characteristics concerning education, labor, income and housing⁹.

	Total	<= 18	Perc
2007	189, 820, 330	63, 774, 154	33.6
2015	204, 860, 101	58, 809, 199	28.7

This is the fraction of Brazilian population less than 18 years old. There is a noticeable percentage decline while the total population is growing. This will impact in the social security benefits. Next, the distribution according to skin color. The percentage of whites is decreasing.

	Brn	Par	Pre	Ama	Ind
2007	49.4	42.3	7.45	0.54	0.29
2015	45.22	45.06	8.86	0.47	0.38

“Pardo” according to IBGE refers to various types of miscegenation. The other categories are branco (“white”), preto (“black”), amarelo (“yellow”, meaning East Asians), and “indígena” (Amerindians). In 2008, according to IBGE, pretos and pardos become the majority, 50.6%, 53.6% in 2014. The 3 % increase is attributed partly to an increase of self-declarations.

Below, the first *household income distribution* table is global, the second gives the marginal distribution inside each color. The Brn, Par, Pre columns shows a visible improvement of household income distribution from 2007 to 2015. However, the income concentration is very high¹⁰, and it is perverse with respect to skin color. The income defining the third quartile is about USD 1,200. Remains to be seen if the deep economic crisis that started in the second semester of 2015 will affect this tendency.

	Brn07	Par07	Pre07	Ama07	Ind07	Brn15	Par15	Pre15	Ama15	Ind15
<i>hi1</i>	8.23	13.71	2.1	0.1	0.09	7.6	14.07	2.52	0.05	0.15
<i>hi2</i>	10.24	11.79	2.08	0.1	0.07	9.33	11.99	2.37	0.06	0.08
<i>hi3</i>	12.07	9.34	1.79	0.11	0.06	11.61	10.89	2.30	0.1	0.07
<i>hi4</i>	17.27	6.56	1.27	0.21	0.06	15.28	7.31	1.51	0.24	0.06
	Brn07	Par07	Pre07	Ama07	Ind07	Brn15	Par15	Pre15	Ama15	Ind15
<i>hi1</i>	16.67	32.41	28.21	17.93	29.56	16.81	31.23	28.42	10.11	39.80
<i>hi2</i>	20.72	27.87	27.96	18.12	22.78	20.63	26.6	26.77	13.41	21.26
<i>hi3</i>	24.43	22.09	24.08	19.83	20.53	25.66	24.16	26	20.64	18.63
<i>hi4</i>	34.96	15.5	17.04	38.28	20.52	33.80	16.21	17.06	50.19	15.39

Quartiles of household income distribution in Brazil (hi)

The monthly values in reais of the household quantile income in 2015 are:

hinc1 = 1265, hinc2 = 2200, hinc3 = 3818, beginning of 4th quartile

In the next tables, generated by the authors, the following abbreviations are used:

M = male ; F = female ; Math = Mathematics ; Port = Portuguese ; the numbers mean year old

Sta = state school; Mun = municipal ; Pri = private .

EF = fundamental (elementary and middle, ends in 5th grade); EM = médio (high school, end in 9th grade)

EF = fundamental (elementary and middle, ends in 9th grade); EM = médio (high school, end in 12th grade)

⁹<http://www.ibge.gov.br/english/estatistica/populacao/trabalhoerendimento/pnad2014/default.shtm> .

¹⁰See data by the Finance Ministry in

<http://www.fazenda.gov.br/noticias/2016/maio/200bspe-divulga-relatorio-sobre-a-distribuicao-da-renda-no-brasil>

Goal 1 (ENROLLMENT, age completed by March 31): last column gives the difference 2015-2007

<i>4 to 17</i>					
	2007	<i>se</i> 2007	2015	<i>se</i> 2015	<i>diff</i>
<i>tot</i>	90.95	0.13	94.14	0.10	3.18
<i>M</i>	90.49	0.17	93.65	0.14	3.16
<i>F</i>	91.44	0.16	94.65	0.13	3.21
<i>hi1</i>	88.81	0.23	92.76	0.20	3.94
<i>hi2</i>	89.86	0.24	93.72	0.19	3.86
<i>hi3</i>	91.61	0.22	94.21	0.20	2.60
<i>hi4</i>	94.99	0.20	96.85	0.17	1.86
<i>brn</i>	92.45	0.16	95.20	0.14	2.75
<i>par</i>	89.84	0.18	93.57	0.15	3.73
<i>pre</i>	89.76	0.44	92.27	0.43	2.51
<i>4 and 5</i>					
	2007	<i>se</i> 2007	2015	<i>se</i> 2015	<i>diff</i>
<i>tot</i>	78.90	0.49	90.45	0.34	11.55
<i>M</i>	78.51	0.63	89.75	0.46	11.24
<i>F</i>	79.32	0.65	91.18	0.45	11.86
<i>hi1</i>	74.23	0.82	88.75	0.59	14.52
<i>hi2</i>	76.04	0.90	89.78	0.66	13.74
<i>hi3</i>	82.43	0.84	90.68	0.68	8.25
<i>hi4</i>	88.57	0.81	94.02	0.67	5.46
<i>brn</i>	81.25	0.64	91.64	0.45	10.38
<i>par</i>	76.91	0.72	89.84	0.48	12.93
<i>pre</i>	77.67	1.84	87.29	1.52	9.62
<i>6 to 14</i>					
	2007	<i>se</i> 2007	2015	<i>se</i> 2015	<i>diff</i>
<i>tot</i>	97.05	0.08	98.46	0.07	1.41
<i>M</i>	96.88	0.11	98.34	0.09	1.46
<i>F</i>	97.22	0.10	98.58	0.09	1.36
<i>hi1</i>	96.11	0.16	97.94	0.14	1.83
<i>hi2</i>	96.60	0.16	98.15	0.14	1.55
<i>hi3</i>	97.52	0.15	98.82	0.11	1.30
<i>hi4</i>	98.77	0.13	99.33	0.10	0.56
<i>brn</i>	97.82	0.10	98.90	0.08	1.08
<i>par</i>	96.57	0.12	98.14	0.10	1.57
<i>pre</i>	95.83	0.37	98.21	0.28	2.38
<i>15 to 17, general</i>					
	2007	<i>se</i> 2007	2015	<i>se</i> 2015	<i>diff</i>
<i>tot</i>	77.27	0.38	83.50	0.31	6.24
<i>M</i>	75.35	0.52	81.58	0.42	6.23
<i>F</i>	79.29	0.46	85.49	0.41	6.20
<i>hi1</i>	69.61	0.76	77.88	0.67	8.27
<i>hi2</i>	73.48	0.70	82.37	0.59	8.89
<i>hi3</i>	78.64	0.63	83.83	0.61	5.20
<i>hi4</i>	87.32	0.58	91.85	0.50	4.53
<i>brn</i>	81.40	0.49	86.50	0.46	5.10
<i>par</i>	73.72	0.52	81.68	0.45	7.96
<i>pre</i>	75.59	1.20	80.76	1.11	5.17
<i>15 – 17, EM</i>					
	2007	<i>se</i> 2007	2015	<i>se</i> 2015	<i>diff</i>
<i>tot</i>	54.52	0.50	65.54	0.43	11.02
<i>M</i>	48.53	0.65	59.92	0.59	11.39
<i>F</i>	60.82	0.58	71.35	0.55	10.53
<i>hi1</i>	36.25	0.90	52.04	0.83	15.78
<i>hi2</i>	46.478	0.84	62.46	0.82	15.98
<i>hi3</i>	58.78	0.79	69.50	0.76	10.73
<i>hi4</i>	76.86	0.72	82.41	0.72	5.55
<i>brn</i>	65.54	0.64	73.66	0.61	8.12
<i>par</i>	45.27	0.68	60.50	0.58	15.23
<i>pre</i>	47.03	1.39	59.50	1.32	12.47
<i>Preschool</i>					
<i>00 – 03</i>					
	2007	<i>se</i> 2007	2015	<i>se</i> 2015	<i>diff</i>
<i>tot</i>	23.91	0.40	33.76	0.47	9.85
<i>M</i>	23.54	0.51	33.51	0.60	9.97
<i>F</i>	24.28	0.52	34.014	0.63	9.73
<i>hi1</i>	16.38	0.52	23.76	0.67	7.39
<i>hi2</i>	20.63	0.64	30.80	0.83	10.17
<i>hi3</i>	27.93	0.79	38.31	0.96	10.38
<i>hi4</i>	38.49	0.96	49.90	1.04	11.41
<i>brn</i>	26.51	0.55	38.11	0.67	11.60
<i>par</i>	20.84	0.54	29.06	0.61	8.22
<i>pre</i>	27.23	1.57	36.10	1.74	8.87

For preschool the National Plan for Education targets 50% in 2024

Fourth table includes delayed students still in EF and students that completed EM

Goal 3 - SAEB data (National Evaluation System for Basic Education)
<http://portal.inep.gov.br/educacao-basica/saeb>

	2005				2015				Diff			
	<i>tot</i>	<i>Sta</i>	<i>Mun</i>	<i>Pri</i>	<i>tot</i>	<i>Sta</i>	<i>Mun</i>	<i>Pri</i>	<i>tot</i>	<i>Sta</i>	<i>Mun</i>	<i>Pri</i>
<i>Math05</i>	18.7	17	13.6	50.9	42.9	45.8	36.80	64.60	24.2	28.80	23.20	13.70
<i>Math09</i>	13	8.5	6.3	47.7	18.2	13.8	12.1	47.3	5.20	5.30	5.80	-0.40
<i>Math12</i>	10.9	4.8		44.3	7.3	3.4		28.9	-3.60	-1.4		-15.40
<i>Port05</i>	26.6	26.5	20.3	61.1	54.7	57.2	48.4	77.40	28.10	30.70	28.10	16.30
<i>Port09</i>	19.5	15	12.7	54.6	33.9	30	26.6	64.3	14.40	15.00	13.90	9.70
<i>Port12</i>	22.6	15.2		63.3	27.5	21.7		60.3	4.90	6.50		-3.00

The numbers Math05, etc. mean grade year

Goal 2 and Goal 4

Goal 2, literacy by the end of second year (8 yrs); second table allowing 1 year of delay

<i>Goal 2 , 8 yrs</i>					
	2007	<i>se</i> 2007	2015	<i>se</i> 2015	<i>diff</i>
<i>tot</i>	76.74	0.68	85.43	0.54	8.69
<i>M</i>	74.26	0.91	84.07	0.75	9.81
<i>F</i>	79.31	0.82	86.83	0.71	7.53
<i>hi1</i>	70.43	1.11	81.27	0.97	10.84
<i>hi2</i>	76.50	1.19	85.69	1.06	9.19
<i>hi3</i>	80.20	1.20	87.99	1.05	7.79
<i>hi4</i>	85.63	1.16	89.74	1.13	4.11
<i>brn</i>	81.77	0.84	88.43	0.78	6.66
<i>par</i>	73.45	1.02	83.40	0.79	9.96
<i>pre</i>	66.86	2.43	84.10	2.07	17.24
<i>Goal 2 at 9 yrs</i>					
	2007	<i>se</i> 2007	2015	<i>se</i> 2015	<i>diff</i>
<i>tot</i>	91.09	0.41	95.37	0.30	4.28
<i>M</i>	89.47	0.55	94.74	0.45	5.27
<i>F</i>	92.74	0.55	96.03	0.41	3.29
<i>hi1</i>	86.77	0.81	94.16	0.60	7.39
<i>hi2</i>	89.85	0.76	95.30	0.60	5.44
<i>hi3</i>	94.60	0.63	96.49	0.58	1.89
<i>hi4</i>	96.83	0.53	96.24	0.67	-0.59
<i>brn</i>	94.45	0.45	96.53	0.43	2.08
<i>par</i>	88.77	0.66	94.74	0.43	5.96
<i>pre</i>	86.70	1.57	94.34	1.32	7.64
<i>Goal 4 5th grade</i>					
	2007	<i>se</i> 2007	2015	<i>se</i> 2015	<i>diff</i>
<i>tot</i>	80.19	0.58	86.06	0.51	5.87
<i>M</i>	75.59	0.81	82.58	0.76	6.99
<i>F</i>	85.12	0.73	89.63	0.62	4.51
<i>hi1</i>	68.60	1.16	80.19	1.01	11.60
<i>hi2</i>	78.80	0.95	84.18	1.03	5.38
<i>hi3</i>	87.31	0.91	89.71	0.87	2.40
<i>hi4</i>	92.79	0.78	94.58	0.81	1.79
<i>brn</i>	87.66	0.65	90.64	0.71	2.99
<i>par</i>	74.36	0.90	83.70	0.72	9.35
<i>pre</i>	NA	NA	78.81	2.14	NA
<i>Goal 4, EF</i>					
	2007	<i>se</i> 2007	2015	<i>se</i> 2015	<i>diff</i>
<i>tot</i>	62.95	0.74	75.94	0.62	12.99
<i>M</i>	55.92	0.99	70.97	0.90	15.06
<i>F</i>	70.51	0.9	80.94	0.78	10.43
<i>hi1</i>	45.30	1.46	62.51	1.27	17.21
<i>hi2</i>	54.37	1.31	72.33	1.21	17.95
<i>hi3</i>	67.52	1.27	82.33	1.02	14.81
<i>hi4</i>	85.03	1.00	90.23	0.92	5.20
<i>brn</i>	74.80	0.95	82.82	0.87	8.02
<i>par</i>	52.82	1.05	71.74	0.91	18.91
<i>pre</i>	56.30	2.48	70.04	2.08	13.74
<i>Goal 4, EM</i>					
	2007	<i>se</i> 2007	2015	<i>se</i> 2015	<i>diff</i>
<i>tot</i>	46.91	0.67	58.50	0.73	11.59
<i>M</i>	40.67	0.95	52.36	1.06	11.69
<i>F</i>	53.24	0.93	64.62	0.98	11.37
<i>hi1</i>	23.15	1.24	41.76	1.471	18.61
<i>hi2</i>	33.21	1.22	51.45	1.50	18.24
<i>hi3</i>	48.75	1.26	58.87	1.41	10.11
<i>hi4</i>	73.53	1.22	79.58	1.23	6.05
<i>brn</i>	58.54	1.01	68.33	1.091	9.78
<i>par</i>	36.85	0.90	51.91	1.01	15.06
<i>pre</i>	35.31	2.30	50.39	2.49	15.08