# Benchmarking secondary education in Brazil*

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In 2005, the Brazilian Ministry of Education introduced IDEB, the Basic Education Development Index, to set targets and monitor the evolution of Brazilian education along two main dimensions, academic achievement and student flow. In this paper, we present a brief discussion of these two dimensions, developed for basic education, discussing the possibility of applying it to secondary education as well.

## Academic achievement

The instrument to measure academic achievement is SAEB[1], an assessment similar to the NAEP, the US National Assessment of Education Progress,

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[1] Crespo, Manuel, José Francisco Soares, and Alberto de Mello e Souza. 2000. "The Brazilian National Evaluation System of Basic Education: Context, process, and impact." Studies In Educational Evaluation 26:105-125.

introduced in Brazil in the 1990s to measure achievement in Portuguese and mathematics for 4th and 8th grades of primary education (primary and lower secondary levels, ISCED 1 and 2) and 3rd grade of secondary education (ISCED 3). The sampling methodology adopted by SAEB only allows for inference at state level (26 states and the Federal District of Brasilia). To obtain data at the school level, the Ministry developed Prova Brasil, an individual test in Portuguese and mathematics linked to SAEB and applied to students in public schools in urban areas at the end of ISCED 1 and ISCED 2 (years 4 and 8).

Brazil also participates in OECD's Programme for International Sudent Assessment (PISA), which assesses the competencies 15 year old students in reading, mathematical and scientific literacy[2]. In Brazil, only students at the 8th grade of basic or first year of secondary education are sampled. Finally, Brazil also participates in SERCE, an assessment carried on by UNESCO's regional office for Latin America and the Caribbean[3].

The only systematic assessment of upper secondary education is SAEB, which, however, does not provide results at school level. In its absence, the Brazilian ministry of education has been using the results of the National Exam for Secondary Education (ENEM) as a proxy to rank schools. ENEM is a voluntary exam for students wishing to enter higher education, and its scores have being adopted by some universities as part of their admission procedures. In 2008, 4 million persons enrolled in exam, and three million participated. In 2009, 4.5 million enrolled. Until 2009, ENEM results were not comparable from one year to another. In 2009 the Ministry of Education changed it profoundly, adopting the "Item Response Theory" methodology that allows for comparisons through

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[2] OECD. 2007. PISA 2006 Science Competencies for Tomorrow's World. Paris: Organisation for Economic Co-operation and Development.

[3] Valdés, Héctor, Ernesto Treviño, Carmen Gloria Acevedo, Mauricio Castro, Sandra Carrillo, Roy Costilla, Daniel Bogoya, and Carlos Pardo. 2008. *Los aprendizajes de los estudiantes de América Latina y el Caribe - Primer reporte de los resultados del Segundo Estudio Regional Comparativo y Explicativo (SERCE)*. Santiago: Oficina Regional de Educación de la UNESCO para América Latina y el Caribe OREALC/UNESCO.

time, and changed it from a competence to a more content-based test, so that it could lead to improvements in the curriculum of secondary education.

| Coverage of Brazilian and International Comparative Assessments | | | | | |
|---|---|---|---|---|---|
| Braziian and International Assessments of Achievement | | | | | |
| | SAEB | Prova Brasil | ENEM 2008 | SERCE/UNESCO | PISA/OECD |
| ISCED 1 | Language, Mathematics - state level (4th grade). State level results | Language, Mathematics - public urban schools (4th grade) | | Language Mathematics - National Samples (3rd grade) | |
| ISCED 2 | Language, Mathematics - state level (8th grade) | Language, Mathematics, public urban schools - state level - 8th grade | | Language Mathematics, Science - National Samples (6th grade) | Language, Mathematics, science - 15 years olds, national level (8th-9th grades |
| ISCED 3 | Language, 3rd grade, secondary) | | Mathematical, artistic and scientific languages; problem solving, social participation (individual, pre-university) | | |

**Table 1**

PISA and SERCE provide a basis for comparing student achievement in Brazil with that of other countries, and SAEB and Prova Brasil allow for comparisons among Brazilian regions. Based on these comparisons, the Ministry of Education has set targets for improving Brazilian education so as to reach the OECD average levels by 2022.

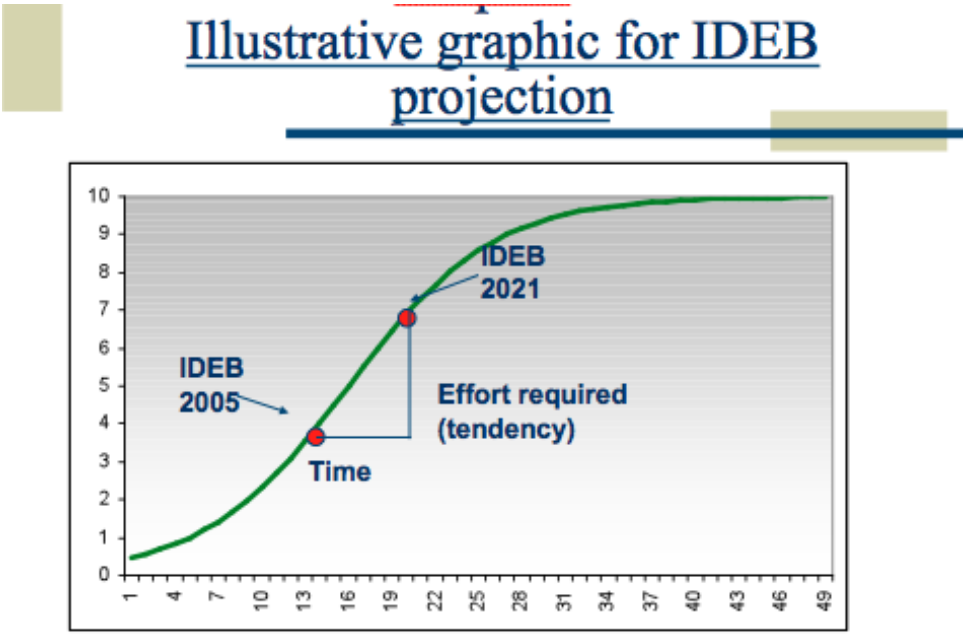


**Table 2. Source: INEP**

Compared with students in the developed OECD countries, the achievement levels of Brazilian 15 year olds in PISA are very low, and are not improving very significantly. Compared with other Latin American and Caribbean countries in

SERCE, Brazilian students at the 3rd and 6th levels of basic education are in a intermediate position, below Cuba, Argentina, Chile and Mexico, for instance, and above Ecuador, Paraguay and Peru, among others. But, of course, Brazil is not a homogeneous country, and regional differences can be almost as wide as those among countries.

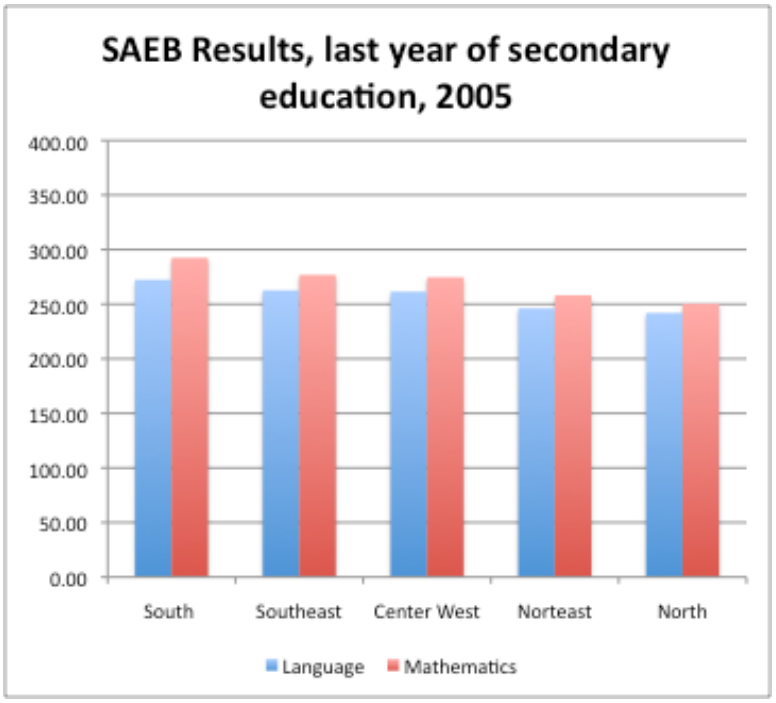


**Table 3**

Table 3 presents the SAEB scores for students completing secondary education by region in the test's scale. The consensus among Brazilian specialists, adopted by "Todos pela Educação"[4], is that the minimum acceptable score for students at this level would be 300 for Portuguese language and 350 for mathematics. In 2007, only 9.8% of Brazilian students reached that minimum in mathematics, and only 24.5% reached the minimum in Portuguese language. The scores in the Southern regions are much higher than those in the North and Northeast, and there was little change between 2005 and 2007.

Besides language and mathematics, secondary school students are supposed to understand and handle scientific concepts. Table 4 presents the distribution of

[4] "Todos pela Educação" (All for Education) is a movement organized by Brazilian entrepreneurs and academics to lobby for education. The targets used by the movement are also adopted by the Brazilian Ministry of Education

students in the PISA 6 points scale of scientific proficiency in Brazil and a few other countries. In Brazil and Argentina, about 28% of the students are below the minimum level, and only 0.5% are in two upper categories. Korea has the profile of a high quality secondary education system, with only 2.5% of its students below the minimum, and 10.3% in the upper group; and Chile is already distancing itself from the other countries in the region.

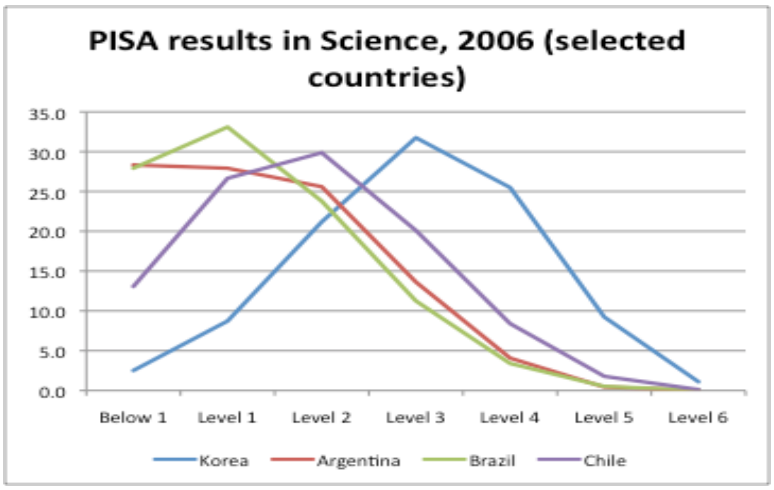


**Table 4**

## Student flow

The second dimension of IDEB is student flow, an index of how many students who enter school in a given year are promoted to the subsequent year. School retention is a very serious problem in Brazil, with much higher figures than that of other countries in Latin America and elsewhere.

| Percentage or Repeaters for Primary (ISCED1) and General Secondary (ISCED 2 and 3), Latin America and the Caribbean, 1999-2008 | | |
|---|---|---|
| | **Primary (ISCED 1)** | **Secondary (ISCED 2)** |
| Argentina | 6.56 | 13.43 |
| Bolivia | 2.49 | 3.48 |
| Brazil | 18.67 | 21.08 |
| Chile | 2.39 | 3.18 |
| Colombia | 2.13 | 2.79 |
| Cuba | 0.54 | 0.56 |
| Peru | 7.81 | 5.62 |
| Uruguay | 6.96 | 13.21 |
| Venezuela | 3.37 | 2.97 |
| All grades, both sexes, latest information | | |
| Soruce: UIS Data Centre | | |

**Table 5**

Students do not move up in the education ladder either because they drop out, or because they are forced to repeat for lack of lack of achievement, or because they

abandon school in one year to return later at the same level. The evidence is that students start to drop out of school in Brazil at age 14 or 15, particularly if they come from low income families and have been not been able to follow their age group in school because of successive repetitions. Data on Table 6 show that, at age 11, 98.6% of the cohort is studying; at age 14, it is down to 94.3, and then it drops to 72.7% at age 17, and 57.4 at age 18.

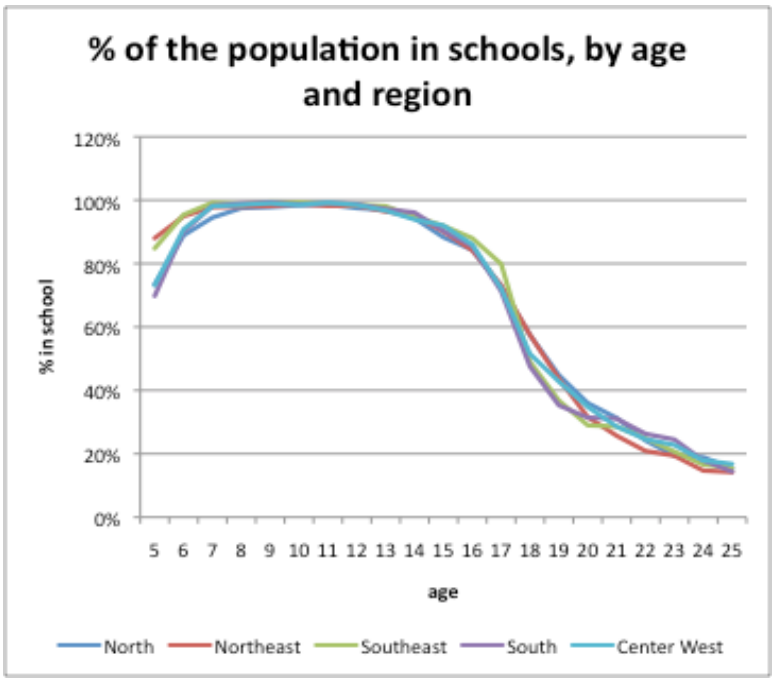


**Table 6**

This pattern of enrollment is very similar for all regions, but the results are widely different, because of different levels of retention and completion rates (Table 7). At age 19, 53%, of the students in the Southeast and South have already competed their secondary education, while the figure for the Northeast is just 29%. Many of these youngsters continue to study, and, at age 25, 56.6% have completed secondary education, varying from 66% in the Southeast to 44% in the Northeast. In the last year of secondary education in the North and Northeast, the students are, on average, four years older than they should, compared with about 2 for the Southeast and South (Table 8).

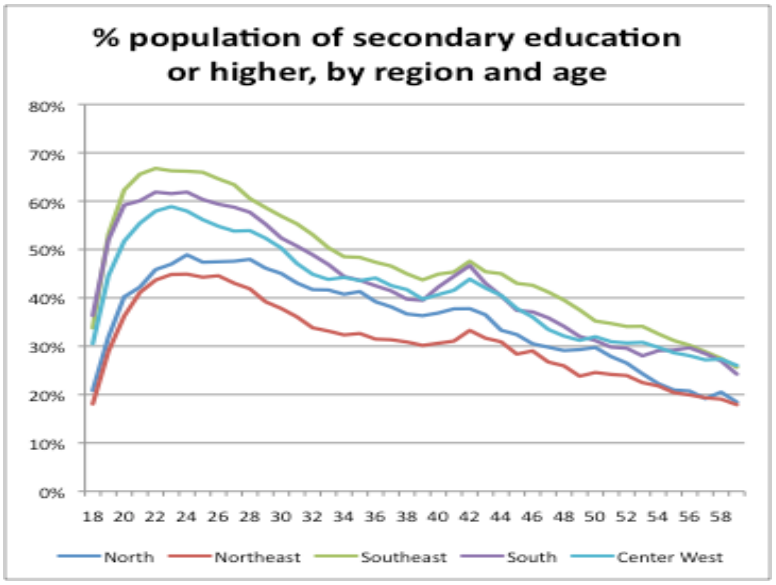


**Table 7. Source: PNAD 2008 (moving averages)**

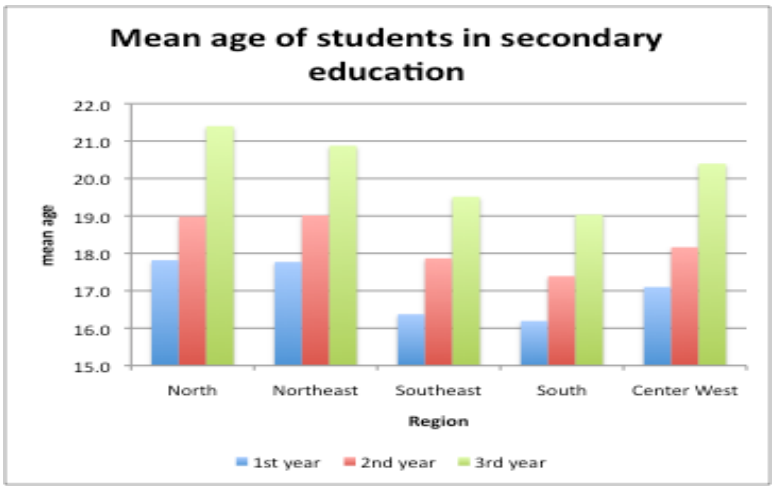


**Table 8**

## The determinants of achievement, retention and desertion

All the assessments carried on by the Ministry and state secretaries of education are accompanied by detailed socioeconomic questionnaires, which can be used to explore the correlates of student achievement. All studies show that there is a clear relation between the socioeconomic status of the family (measured by income, parent's education or color of skin) and achievement, retention and desertion. One point of contention among specialists is whether students drop out because they need to work, or because of the failures of schools to provide them with a meaningful education. The evidence shows that, for an adolescent, it is very difficult to find a job and earn a significant income, which suggests that, at

least before age 18, the push from defective schools is more important than the pull from the labor market.

Beyond the socioeconomic conditions, school factors can also play an important role. One of the most interesting findings of the SERCE results is that the main determinant of achievement in the region is "school climate" defined by indicators such as the pleasure and tranquility the students feel in their school, the feeling of belongingness and their relationships with their colleagues, the attention and support they receive from the teachers, and the student's discipline.

A detailed analysis of the state of São Paulo's student assessment (SARESP) found that 20% of the variation in achievement is explained by school factors and another 20% by the student's characteristics, with the remaining 60% not explained by the existing data. Overall, the main individual indicators are skin color, parent's education and their involvement with the student activities, and preschool; the main school factors are related to the teacher qualifications and their stability and their assiduity. For students at the end of secondary school, given the selection effect, the main explaining variables are the parent's higher education, gender and correct age[5].

### The missing factors - school differentiation and catch-up programs

All these assessments assume that secondary education is a continuation of the previous years, and that the students should be evaluated according to the same main dimensions in the core areas of language and mathematical reasoning, perhaps with the addition of the understanding and use of scientific concepts. In most countries, secondary education is highly differentiated, either through different education paths (academic, vocational, mostly in Europe and in some Latin American countries – see Table 9) or allowing for different paths in comprehensive high schools in Britain and the United States. In Brazil, however,

[5] Menezes-Filho, Naercio and Fernanda Patriota Ribeiro. 2009. "Os determinantes da melhoria do rendimento escolar." Pp. 171-188 in *Educação básica no Brasil - construindo o país do futuro,* edited by F. Veloso, S. Pessoa, R. Henriques, and F. Giambiagi. Rio de Janeiro: Editora Campus - Elsevier.

the curriculum is unified and overloaded with a large number of mandatory courses (including sociology and philosophy, besides mathematics, physics, chemistry, biology, Portuguese language and literature, English and Spanish, among others), and also by the requirements of the entrance examinations for the universities.

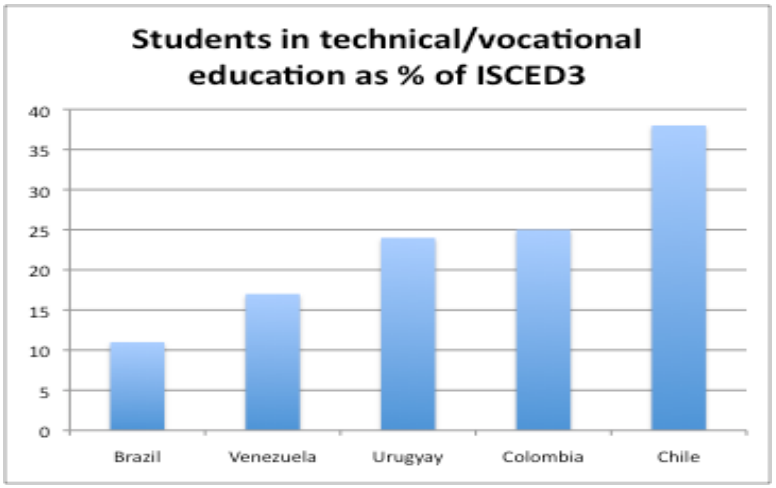


**Table 9.Source: UNESCO Institute for Statistics**

In 2007, the National Household Sample Survey (PNAD) included a special supplement on technical and non-regular education, which showed about 6 million persons declaring to be doing some kind of professional education course. The "S" system, the network of professional education institutions associated with the business sector, responds for about 14%, and about 60% are in private institutions of some kind, with only a fourth in public institutions.

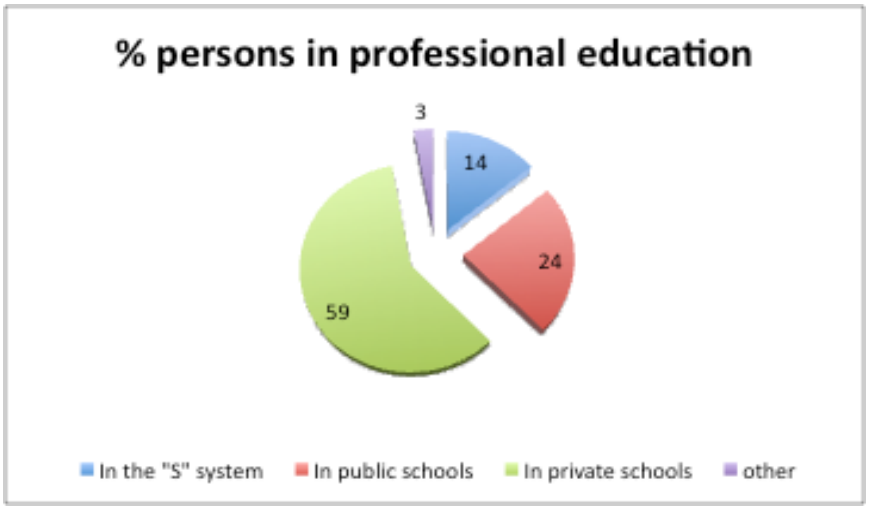


**Table 10. Source: PNAD 2007**

In relative terms, this figure is very small, reaching less than 10% of the age cohort (Table 11). It is also difficult to know what these courses actually mean. In terms of contents, 67.5% are in information technology ("informática"), and 13% in commerce and management. Of the total, 17.5% are given in secondary schools, and 1.5% in short-term post-secondary courses. There is little information, however, about the remaining 81%.

Table 11 shows also that 18% of the 15-17 cohort are out of school, either working or not. To allow this and older persons to catch up and get their secondary school degree, the government introduced a program of "Education of Youngs and Adults" (EJA), which can be either provided by the education institution or at distance, leading to a qualifying exam either for the basic or secondary education. There are two issues with this program, however; the first is the relatively small number of persons enrolled in these programs; and the second is whether an approval at EJA is actually equivalent of a regular secondary education degree.

| Study and occupation of younsters 15-17 | | | | | | | |
|---|---|---|---|---|---|---|---|
| | in professional education | in ISCED2 | In ISCED3 | in catch-up (EJA) courses | Works and study | Works only | does nothing |
| North | 6.4% | 39.1% | 36.2% | 3.6% | 20.1% | 9.2% | 10.7% |
| Northeast | 5.8% | 42.8% | 34.5% | 2.8% | 23.1% | 8.9% | 10.3% |
| Southeast | 12.3% | 23.5% | 58.7% | 1.4% | 19.3% | 7.0% | 8.7% |
| South | 11.8% | 21.7% | 55.0% | 2.2% | 27.4% | 10.2% | 9.1% |
| Center West | 9.0% | 28.1% | 49.6% | 2.3% | 21.6% | 7.8% | 10.5% |
| Total | 9.4% | 31.1% | 47.9% | 2.2% | 21.9% | 8.3% | 9.6% |

**Table 11. Source: PNAD 2007**

## Conclusions

The different assessments confirm that Brazil still has a long way to go both in terms of retention and the quality of basic and secondary education, with wide differences among regions and states. Even the best state in the 2005 SAEB scores, Rio Grande do Sul, was below the minimum acceptable levels of 350 and 300 points in mathematics and Portuguese language (scoring 306 and 282), and the states in the Northeast remained in the 250 points range in both tests.

By combing achievement and student flow in the same index, IDEB contributes to make clear that achievement levels should not be secured at the expense of the less performing students, and social promotion cannot be implemented at the expense of quality. Given the strong Brazilian tradition of repetition and the recent, not very positive experiences of social promotion, these are very important messages. Hopefully, this could bring Brazil in line with other countries in the world, where retention is a minor, residual issue.

If this is right for basic education, where student enrollment approaches 100%, it is more complicated for secondary school, where the liquid enrolment rate was 43.8% for 2008, with little variation in the last several years (**Error! Reference source not found.**). Clearly, one reason for this is the bad quality of preschool and basic education, which impacts the subsequent years. For Brazilian secondary education to grow and to improve, it needs to differentiate, providing different of courses for students with different backgrounds and professional career prospects; and it needs also to become much less bureaucratic and centered on root learning, both for the vocational and the more academic varieties.

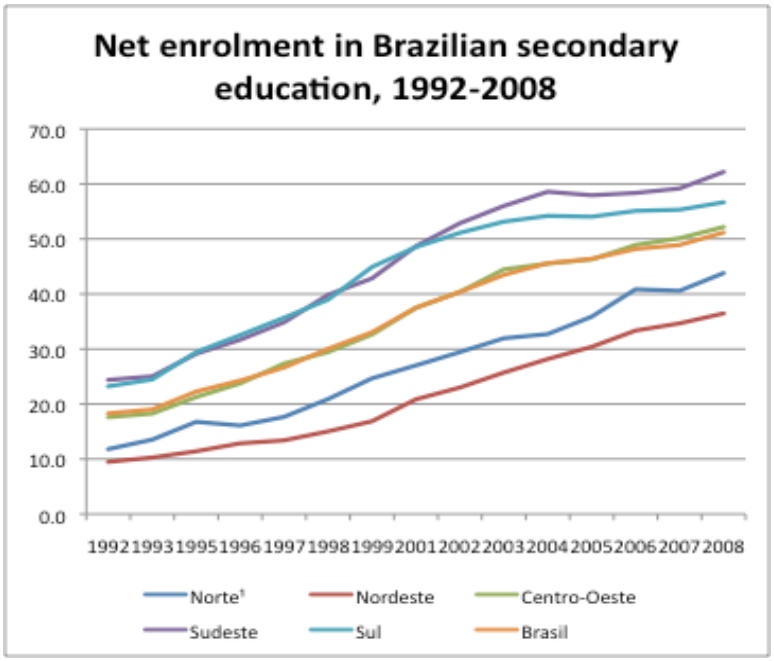


Table 12 . Source: PNAD

The challenges associated with differentiation are not trivial. Professional education cannot become a second-rate alternative for those unable to follow the academic curriculum, and it is not possible to come back to the old segmented systems which, even in the best cases, divide the students along stratified study tracks, strongly correlated to their family's social origins[6]. The experiences of comprehensive schools in countries that have adopted them are controversial, and cannot be copied without clear understanding of its difficulties and risks. But it is clear that, if these issue is not tackled, Brazilian secondary education can even start to expand again, but it is very unlikely that it will reach the expected levels of quality in the next decade.

For this reason, the direct extension of the IDEB methodology and projections for secondary education is not very useful, if the issues of content and differentiation are not explicitly taken into account. Along with the assessment of general

[6] Schwartzman, Simon and Micheline Christophe. 2005. A sociedade do conhecimento e a educação tecnológica, vol. 2. Rio de Janeiro: SENAI - Departamento Nacional.

education skills, it would be necessary to set targets for the expansion of vocational education, and to develop specific tools for the assessment of non-formal learning, linked to competencies, performance and aligned with later work, as well as indicators related to after-school career and professional paths. These indicators could be very useful to stimulate and follow the introduction and implementation of appropriate policies for this level of education.