Analysis of the distribution of opportunities to learn mathematics in Brazil

1. Theoretical Framework:

The literature argues that to achieve a quality education is essential to ensure the learning of all students. For this reason, such studies investigate which factors can influence learning in order to support public policies that promote the reduction of educational inequalities. These studies – historically known as school effectiveness research – usually divide the elements that influence learning into: i) external school factors (BOURDIEU; PASSERON, 1977; COLEMAN et al., 1966); and ii) internal school factors (BIONDI; DE FELÍCIO, 2007; LOUZANO, 2007; SAMMONS et. al., 1995).

In addition, various studies have shown that among all internal school factors, the elements that constitute teaching and pedagogical practices - known in the literature as opportunity to learn (OTL) factors - are the ones that most impact student learning, including those with low socioeconomic status. (MCDONNELL, 1995; STEVENS, 1993, 1996). Among the OTL factors that most improve learning are some categories: i) observable characteristics of teachers, such as academic training and classroom experience (BROPHY; GOOD, 1986; CAMERON; Connor; MORRISON, 2005; DARLING-HAMMOND, 2004, 2013; DARLING-HAMMOND; YOUNGS, 2002; HANUSHEK; RIVKIN, 2006; ROSE; MEDWAY, 1981; SIMIELLI, 2015); ii) learning environment (EMMER; STOUGH, 2001; EVERTSON et al., 1983; EVERTSON; HARRIS, 1999; JOHNSTON, 2009; KANE; STAIGER, 2012; LAVY, 2010; RIVKIN; SCHUMAN, 2015); iii) high expectations (PIANTA; HAMRE; ALLEN, 2012; RUBIE-DAVIES; HATTIES; HAMILTON, 2006; WEINSTEIN, 2002); and iv) classroom management and pedagogical approach in mathematics (BOALER, 2015, CARNOY; GOVE; MARSHALL, 2003, 2007; COHEN; LOTAN, 2014; MACCINI; GAGNON, 2000).

2. The research and issue under consideration:

This paper performs an empirical study to understand the distribution of 5th and 9th grade Brazilian students’ opportunity to learn mathematics among different socioeconomic and ethnic-racial groups in order to answer two questions: i) What is the distribution of OTL for students in Brazilian education, mainly in terms of processes within the school and classrooms? and ii) Does this distribution vary
among students of different socioeconomic levels, ethnic-racial groups and school years?

3. Methodology and Data Source:

This paper uses SAEB 2015 data and develops a logit model, to calculate the probability of 5th and 9th grade students from different socioeconomic and ethnic-racial having access to the opportunity to learn mathematics.

4. Discussion of results and implications:

The results of the logit model for each OTL factor analyzed show different challenges for Brazilian education. The factors of the category "observable teacher characteristics" are not a great challenge because either the probability of access is high for all subgroups of students or when the probability is not so high, there is practically no inequality between socioeconomic levels and groups ethnic-racial relations. On the other hand, the factors of the category "teachers with high expectations" are challenging both in terms of increasing access probability and decreasing inequality. In the category "teachers committed to a learning environment" is necessary to reduce the inequalities between the subgroups of students and increase the probability of access for all subpopulations, even the most privileged ones. Finally, in the category "classroom management and pedagogical approach in mathematics" is necessary to increase the probability of access to factors that increase OTL and decrease the probability of access to factors that decrease OTL for all socioeconomic levels, including for the most privileged students. Therefore, it is essential to invest in educational policies that focus their actions on OTL factors, mainly those directly related to the classroom, in order to increase the learning opportunities of Brazilian students and reduce the existing inequalities among subpopulations of students.

5. Connection to the conference theme:

This research is relevant to conference theme because (i) it analyzes several factors deeply that can improve student learning and the quality of schools, and (ii) it develop a methodology for deepening knowledge and map educational inequalities. Both procedures can be scaled to other countries.
6. References:


Pianta, R. C., Hamre, B. K., & Allen, J. P. (2012). Teacher-student relationships and engagement: Conceptualizing, measuring, and improving the capacity of classroom interactions. In Handbook of research on student engagement (pp. 365-386). Springer US.


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