

## **Raising the Learning Bar in Latin America**

*Measuring Student Outcomes*

*J. Douglas Willms, University of New Brunswick*

*Marie-Andrée Somers, Harvard University*

A well-educated citizenry is the most effective tool to foster economic progress in low-income countries. Yet, student achievement is not as high as it could be, despite government efforts to address the quality, quantity and equity gaps in education. Student expenditure is the most commonly cited factor for achievement variances amongst low-income countries. However, evidence from many international studies suggests that investing more money per student is only slightly correlated with a country's educational performance. A range of factors depicting the culture of schooling, including those pertaining to teachers' attitudes, principal's autonomy and the learning climate of the school must be taken into account.

This Policy Brief looks at student outcomes in Latin America. The studies summarized below expand on the results of the UNESCO sponsored Primer Estudio Internacional Comparativo (UNESCO, 1998; Willms & Somers, 2000, 2001) by determining specific causes of poor educational achievement in Latin America. Using multivariate analyses to control for variables associated with family background, the authors provide compelling evidence that the countries in question differ considerably in their outcomes, and that there is no single school-level factor that can explain the large differences between the lowest and highest scoring schools in the region.

### **KEY POINTS:**

- The relationship between academic achievement and family background varies among Latin American countries. The most successful country, Cuba, has uniformly effective schools, and relatively small inequalities along social class lines and between the sexes.
- Countries with superior academic achievement for their least advantaged students tend also to have superior academic achievement for their students from advantaged backgrounds.
- Across Latin America the most effective schools tend to be those with high levels of school resources; classrooms which are not multi-grade, and where students are not grouped by ability; classrooms where children are tested frequently; classrooms and schools with high levels of parental involvement; and a positive learning climate, especially with respect to classroom discipline.
- In both language and mathematics, the two most important predictors were parents' education and whether there were 10 or more books in the home. The results suggest that children's scores increase for each additional year of education that the parents have.
- The effects associated with the socioeconomic background of the students may account for a substantial portion of the achievement gap between public and private schools in Latin America as it is typically measured.

## Introduction

Important findings emerged from the UNESCO Santiago sponsored Primer Estudio Internacional Comparativo (PEIC), a regionally designed and operated educational assessment that was conducted in 13 Latin American countries in 1997. Some 50,000 third and fourth graders completed mathematics and reading achievement tests. The results gave the countries a clear sense of where they are, where they want to go, and how far they are from getting there with respect to school outcomes. The region-wide study also provided data that would be more responsive to local and national interventions.

Latin American students scored far below the expectations of educators and researchers. Among the 12 countries that published results, Cuba scored almost two standard deviations (or two whole school years) higher than the other countries in the region. Chile, Argentina and Brazil scored relatively well, and Honduras, the Dominican Republic and Venezuela scored relatively low. Students in urban areas (mega-cities) and students in private schools scored highest. The rural poor scored among the lowest. A country's income level had a smaller than expected impact on its educational achievement. Cuba, with one of the region's lowest per-capita incomes, excelled, while Venezuela, one of the region's highest income countries, was among the lowest achievers.

## Factors Affecting Student Achievement

Large scale studies of schooling in low-income countries have traditionally emphasized the importance of human and material resources, including factors such as school infrastructure, class size, teachers' experience and qualifications, and the availability of instructional materials (Fuller & Clarke, 1994). Underlying this *economic production function* approach is the assumption that if we can determine the most important factors pertaining to school quality, governments will be able to improve academic achievement by investing in them (Heyneman & Loxley, 1983).

In contrast, many educational reformers contend that the research has not paid sufficient attention to school and classroom processes, and the demands and preferences of families and local communities (Apple, 1990; Mehan, 1992). Accordingly, the PEIC collected data on a range of factors depicting the culture of schooling, including those pertaining to parental involvement, teachers' attitudes, principals' autonomy and the learning climate of the school.

## Schooling Outcomes in Latin America

Willms and Somers' (2000; 2001) report on the PEIC provides detailed descriptions for each country of the relationships between student outcomes (language, mathematics, and the time to grade completion) and family socioeconomic status (SES), extent of urbanization (i.e. rural, urban, mega-city), a range of factors depicting material resources (e.g. class size, school infrastructure, teachers' qualifications) and the culture of schooling (e.g. parental involvement, teachers' attitudes, principal's autonomy, and the learning climate of the school).

The work integrates a socioeconomic gradient approach with an economic production function perspective (Lau, 1979). The former depicts the relationship between social outcomes – in this case, school outcomes – and an individual's SES, which is usually represented by levels of education, occupational prestige, and income. The latter examines the variance associated with factors pertaining to the quality of schooling, separate from factors associated with students' family background. By combining the two approaches the authors move the argument away from economic policy to increase debate concerning social policy.

Their analysis of the PEIC data employed hierarchical linear models (Goldstein, 1996; Raudenbush & Bryk, 1986) to discern the relationship between school outcomes and family, classroom, and school variables. This approach allowed the authors to examine whether the effects of a range of family and school factors varied among communities. Measures of the three schooling outcomes were taken, and the proportions of their variance were determined within and between schools. Regression analysis was then used to estimate the effect of SES and early childhood experiences on schooling outcomes.

A third study (Somers, McEwan, & Willms, 2004) used multilevel modeling to assess the relative effectiveness of private and public schools in 10 Latin American countries. The analysis asked whether private schools produce greater amounts of desirable outcomes, regardless of the background of their students.

## Variation in Student Outcomes

The studies do not identify any single school level factor which can explain the large differences between the lowest and highest scoring schools in Latin America. Some of the more noteworthy results are highlighted below:

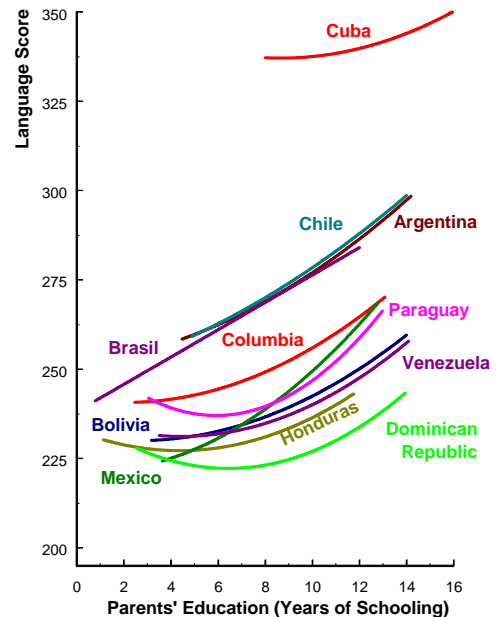
**School Expenditure.** The effect of any particular resource variable is relatively small, but taken together, they represent a sizeable impact. For example, if a school could decrease pupil teacher ratio by five students, increase its number of instructional materials by five items, increase the level of teacher training by one year, it would have an expected gain of about 15 points (0.3 of a standard deviation) in language scores (Willms & Somers, 2001). Neither teachers' experience nor school infrastructure had a notable effect on achievement, which is surprising given the attention that both of these factors have attracted from policy makers.

**Classroom Climate.** Higher achievement outcomes are evident in classrooms and schools with high levels of parental involvement. Students also appear to perform better in classrooms which are not multi-grade, where students are not grouped by ability, and where children are tested frequently. Students who are in classes where classmates do not disturb others, where fights seldom occur, and where students are good friends have much higher scores than students in more disorderly classrooms. The large effects associated with classroom discipline suggest that many teachers would benefit from training in classroom management.

**Socioeconomic Status (SES).** The relationship between schooling outcomes and family background varies among countries. The most successful country, Cuba, has uniformly effective schools, and relatively small inequalities along social class lines and between the sexes. The variation among schools in language and mathematics test scores is lower than the variance among schools in SES for nearly every country. This suggests that inequalities in achievement are not quite as high as one might expect, given the extent of segregation along social class lines. To some extent, therefore, schooling has a leveling effect in the region. However, the extent of between school variance in achievement is much higher than in most high income countries.

**Hypothesis of Converging Gradients.** Socioeconomic gradients do not converge for the eleven countries in the study. The hypothesis of converging gradients asserts that countries with high levels of schooling outcomes are those that have been successful in raising the achievement levels of their least advantaged youth (Willms, 2003). This hypothesis holds for Cuba, which has high scores and a flat gradient. However, the gradients for the other countries are more or less parallel. Thus, countries with superior outcomes for their least advantaged students

also tend to have superior outcomes for their students from advantaged backgrounds.



**Figure 1. Socioeconomic gradients for 11 Latin American countries.**

**Parents' Education.** In both language and mathematics, the two most important predictors were parents' education and whether there were 10 or more books in the home. Children's scores increase for each additional year of education that the parents have. However, the gradients associated with parents' education vary considerably across countries, and for several countries are not statistically significant. Parents' education does play a strong role across all countries in determining how long it takes for a child to complete primary school.

**Repetition Rates.** Early grade failure is one of the best predictors of whether a child will complete secondary school. Reducing repetition rates is central to the long-term success of schooling in Latin America, and is an outcome that can be easily improved through local and national policy. Brazil, Honduras, and Mexico have very high repetition rates: the completion time in these countries ranged from 1.15 to 1.19 years per grade. Boys were less likely than girls to complete grade 3 without having repeated a grade.

**Public V.S. Private Schools.** Although private schools on average have higher levels of school performance than public schools, most of the difference is attributable to student and family characteristics, and the effect associated with the intake composition of the school. After the effects of student background are taken into account, the private-public

achievement differences declined markedly for all countries. Further control for the intake composition of the school resulted in achievement gaps between the two sectors that were even smaller and, in some instances, negative. These results suggest that peer group effects and other effects correlated with a school's intake may account for a substantial portion of the private school effect. From a family's perspective, parents may care very little whether their child's achievement is enhanced by the school and classroom practices or by effects associated with school composition. But from a government's perspective, it is a zero-sum game, and raises questions about the benefits of policies that increase participation in the private sector, such as large-scale voucher programs.

### Final Note

Assessments such as PEIC are in most respects blunt instruments. They can point towards factors such as classroom discipline and regular testing as being important, but they cannot capture any of the complexities entailed in trying to effect change at the local level. Moreover, they cannot capture the political and social challenges that are very much present in the Latin American context.

### ❖ About CRISP

The Canadian Research Institute for Social Policy (CRISP) is a multi-disciplinary research organization dedicated to: conducting policy research aimed at improving the education and care of Canadian children and youth, contributing to the training of social scientists in quantitative research methods, and supporting low-income countries in their efforts to build research capacity in child development.

### ❖ About the Research

CRISP's research program, "Raising and Levelling the Bar" conducts research based on Canada's National Longitudinal Survey on Children and Youth (NLSCY) and other national and international surveys. It explores specific factors that can contribute to the improvement of outcomes for Canada's young people. The program is funded by the Social Sciences and Humanities Research Council's Initiative on the New Economy.

The Primer Estudio Internacional Comparativo was conducted by UNESCO's Latin American Laboratory for Assessing Quality in Education. Education officials in each country submitted detailed descriptions of what third and fourth graders are taught and what they are expected to learn by the end of the school year. Participating schools were selected to represent three demographic categories: very large cities (one million or more inhabitants), urban centers with less than one million people, and rural areas. Within urban areas, the study also distinguished between public and private schools.

### ❖ About this Policy Brief

CRISP's Policy Briefs are designed to highlight key policy implications of research findings. They are available in paper form and on CRISP's website at [www.unb.ca/crisp/pbrief.html](http://www.unb.ca/crisp/pbrief.html). The main analysis in this Policy Brief was carried out by J. Douglas Willms, Director of CRISP, Marie-Andréé Somers, Harvard University PhD candidate, and Patrick J. McEwan, Assistant Professor in the Department of Economics at Wellesley College. Stacey Wilson-Forsberg, Knowledge Transfer Manager at CRISP, drafted the brief.

### ❖ Further Reading

- Apple, M. (1990). *Ideology and curriculum*. New York: Routledge.
- Fuller, B., & Clarke, P. (1994). Raising school effects while ignoring culture? Local conditions and the influence of classroom tools, rules, and pedagogy. *Review of Educational Research*, 64, 119-157.
- Goldstein, H. (1996). *Multilevel statistical models* (2<sup>nd</sup> ed.). London: Edward Arnold.
- Heyneman, S.P., & Loxley, W.A. (1983). The effect of primary school quality on academic achievement across twenty-nine high- and low-income countries. *American Journal of Sociology*, 88, 1162-1194.
- Lau, L.J. (1979). Educational production functions. In D.M. Windham (Ed.), *Economic dimensions of education* (pp. 33-69). Washington D.C.: national Academy of Education.
- Mehan, H. (1992). Understanding inequality in schools: The contribution of interpretive studies, *Sociology of Education*, 65, 1-20.
- Raudenbush, S. W. and Bryk, A.S. (1986). A hierarchical model for studying school effects. *Sociology of Education*, 59(1): 1-17.
- Somers, M.A., McEwan, P.J. & Willms, J.D. (2004). How effective are private schools in Latin America? *Comparative Education Review*, 48(1), 48-68.
- UNESCO. (1998). *Primer Estudio Internacional Comparativo*. Santiago, Chile: Author.
- Willms, J. D., & Somers, M-A. (2001). Family, classroom, and school effects on children's educational outcomes in Latin America. *International Journal of School Effectiveness and Improvement*, 12(4), 409-445.
- Willms, J. D., & Somers, M.-A. (2000). *Schooling outcomes in Latin America*. Report prepared for UNESCO.
- Willms, J.D. (2003). Literacy proficiency of youth: Evidence of converging socioeconomic gradients. *International Journal of Educational Research* 39(3), 247-252.