THE GERES PROJECT: A LONGITUDINAL STUDY OF THE 2005 SCHOOL GENERATION IN BRAZIL

Nigel Brooke

1. INTRODUCTION

As a region, Latin America is not closely associated with the "effective school' research tradition. Although there are examples of production-function research on the relationship between school factors and pupil learning that go back to the 1970s, such as the studies sponsored by the Joint Program on Latin American Economic Integration (ECIEL) in Chile, Mexico and Bolivia (Schiefelbein and Clavel, 1977; Munoz-Izquierdo and Rodriguez, 1976; Comboni, 1979), research to measure the differential impact of schools on achievement has not been a constant of educational research in the region. However, a recent review by F. Javier Murillo (2003) indicates that the effective school paradigm is becoming progressively more widespread with new research being undertaken in Chile, Bolivia, Venezuela, Colombia, Argentina and Mexico.

Brazil, surprisingly, gets fewer mentions. Although the biggest country in the region, with more than 200,000 elementary and secondary schools, a school population of 43 million and a huge array of institutions of postgraduate research and teaching in education, Brazil gets less coverage when it comes to state-of-the-art descriptions of research using the effective school paradigm. Although the Portuguese language is less used in the international communication of educational research results, it is not because the literature reviews have been carried out in Spanish that Brazil has occupied less space. Nor is it for the lack of good reasons for studies concerning the problem of educational quality. The Brazilian Ministry of Education has interpreted recent national evaluation results to show that 59% of 4th graders are either incapable of reading, or have yet to learn how to read more than just simple sentences, and that only 4.8% of children in that grade can be considered to be reading at a level considered adequate for their age (MEC, 2003).[1] The truth is that with a few recent exceptions, summarized by Franco *et al*. (2003), there has been very little effective school research designed and carried out for the purpose of measuring the size and permanence of school effects or for identifying school factors associated with effectiveness.[2]

The need to establish a stream of school effectiveness research in Brazil is strengthened by the appearance of school effectiveness language in the discourse of educational authorities. In other words, the belief that it is possible to identify what makes some schools more effective than others and

[1] The proportion demonstrating Maths abilities considered appropriate for the 4th grade is 6.8%.

[2] Although not the subject of this paper, it is interesting to speculate on the absence of Brazilian school effectiveness (SE) research. In the author's view, the lack of research denotes three things: 1. a deep resistance to the incorporation of external references in the field of education research, especially if these references are seen to be associated with the research efforts and other activities of such multilateral organizations as the World Bank., 2. the absence of departments or even of courses dealing with quantitative research methods within university education faculties, leading to almost complete blindness regarding the use of statistical methods in educational research, and 3. a particular resistance to educational assessment and to research that makes use of external assessment methodologies.

to then make these characteristics the object of public policies designed to improve system results has already found its way into the education decision-making process. This could be a positive development were it not for the likelihood that the ensuing policies will be based on the interpretation of results derived from the school systems of the developed countries. Without the generation of local knowledge, through research that is sensitive to the particular social, economic and cultural context of Brazilian schooling, policy-makers run the risk of arriving at the wrong conclusions and of transplanting inappropriate solutions.

Government discourse regarding school effectiveness has also being fuelled by the National System of Basic Education Evaluation (SAEB) that at the same time as it measures pupil performance in the 4th and 8th grades and in the last year of secondary schooling also collects a significant amount of information on the social and educational context in which this performance takes place. However, the relationships between these factors and pupil performance are often mistakenly understood as indicating the components of effective schooling. The confusion here is between performance and learning. To determine school effectiveness requires a measure of learning which can only be achieved by accompanying the pupil over a period of time with a research model that is longitudinal in its design and in its repeated measures of pupil performance. To attribute the learning demonstrated by test results to the specific conditions of the school at the time of a single measure of performance is to misunderstand the cumulative process of learning and to underestimate both the variation in school conditions over time and the degree of pupil mobility between schools.

2. THE ADVANTAGES OF LONGITUDINAL RESEARCH.

The Longitudinal Study of the 2005 School Generation--the GERES project--is the first longitudinal research program to broach the question of elementary school effectiveness in Brazil. In comparison to SAEB's transversal methodology for the identification of school factors associated with better pupil performance, GERES offers a number of clear advantages. The first of these is that the SAEB data is extremely sketchy and sometimes unreliable on such crucial questions as parental education and income. Because SAEB's contact with the school is a once-only affair, there is no time to improve this information by using the more detailed methods of data collection, such as interviewing the pupils' parents, that are available to GERES. Furthermore, the SAEB sample is a sample of pupils rather than of schools, and even those schools included in the sample are not adequately represented by the selected pupils. Despite recent discussions regarding the possibility of turning SAEB into an instrument for the assessment of the entire universe of 4^{th} and 8^{th} grade pupils, the national assessment program was never expected to be more than a way to monitor the general progress of basic education across the different states and grades and was not designed to produce school-level results capable of determining the relative effectiveness of different schools.

It is also worth repeating that the SAEB performance data is a once-only measure of achievement rather than a study of learning growth. Attempts to use the school data collected on the same day in order to study the impact of school conditions on performance must assume that all previous learning took place under identical conditions, (even when we know that each grade means a different teacher, different surroundings and different curriculum) or that performance variations can be attributed to the pupil's current learning context. We know both assumptions to be incorrect. SAEB is also unable to give us a clear notion of what the pupil brought with him in terms of prior learning. As Lee (2001) clearly states: "The ability to demonstrate how schools influence the students who

attend them is strengthened by being able to take into account the status of these students at the point that they enter the schools…" (Lee 2001)

3. BRAZILIAN SCHOOL EFFECTIVENESS LITERATURE

Project GERES is a longitudinal study of elementary school children in five different cities in Brazil. Over a period of four years, starting in 2005, approximately 27.000 pupils from a sample of 308 state, municipal and private schools will be tested once a year in Maths and Reading while teachers, school principals, parents and the pupils themselves will be interviewed to determine the impact of both family and school factors. The school factors chosen for this research are derived from an extensive review of both the national and international literature, with special concern for those characteristics indicated as being of relevance in the Brazilian context, namely school resources, school organization and governance, academic climate, teacher education and salary and classroom pedagogy.

Unlike in the developed countries, where school resources are reasonably equally distributed and are not a significant factor of school effectiveness, the Brazilian literature indicates considerable variation in school resources and their importance in the explanation of pupil performance in the 8th grade (Albernaz, Ferreira and Franco, 2002) and in Brazil's PISA 2000 results (Lee, Franco and Albernaz, 2004). The same literature also shows that schools are more effective when school leadership is both dedicated and appreciated by teachers (Soares, César and Mambrini, 2001; Soares and Alves, 2003) and when there is a sense of collective responsibility for pupil results (Espósito, Davis and Nunes, 2000). In line with findings world-wide, Brazilian research also shows that a school climate oriented towards academic results, as measured by teacher emphasis on homework (Franco, Albernaz e Ortigão, 2002) and the importance teachers attach to standards of performance (Lee, Franco and Albernaz, 2004) makes a significant contribution to school effectiveness. Conversely, and as would be expected, the absenteeism of both teachers and pupils has a regressive effect on school effectiveness. Albeit sparse and less emphatic, the literature also produces evidence of the positive effect of an increase in the educational level of teachers (Albernaz, Ferreira and Franco, 2002) and that recent salary increases for public school teachers has reduced performance differences between public and private schools. Although deserving of much greater interest by researchers, results of work concerning different styles of classroom pedagogy seem to indicate the superiority of methods employing higher order thinking in mathematics (Franco, Sztajn and Ortegão, 2004) and more active methods of teaching (Soares, Mambrini, Pereira and Andrade, 2004).

4. RESEARCH OBJECTIVES AND DESIGN

By raising detailed information on each of the factors outlined above and analysing their influence on pupil performance through the use of multilevel linear regression, the research proposes to achieve four different objectives of major interest in the discussion of policy alternatives for the improvement of educational quality:

- To identify those school characteristics that maximize student learning while minimizing the impact of social background.
- To identify those school characteristics that reduce the probability of grade repetition.

- To identify those school characteristics that reduce the probability of absenteeism.
- To identify those school characteristics that increase pupil self-esteem and motivation for learning.

The main preparations so far, to ensure the implementation of a research program that can survive long enough to fulfill the stated objectives, fall into five different categories: a) the institutional architecture, b) the sample, c) the schedule/ design of the study, d) the cognitive instruments, and e) the contextual instruments and school information schedule.

a) The architecture: The research is being undertaken by six different universities working in the form of a consortium. With the exception of the State University of Mato Grosso do Sul, incorporated as the result of the that State's geographic location and the need to extend coverage to the centre-west of the country, all members of the consortium have previous experience of research in the field of educational assessment. These member institutions are the Educational Evaluation and Measurement Group of the Faculty of Education, Federal University of Minas Gerais, the Laboratory of Educational Evaluation of the Catholic University of Rio de Janeiro, the Evaluation Laboratory of the Faculty of Education of the State University of Campinas, the Postgraduate Program in Educational Evaluation of the Federal University of Bahia and the Centre for Educational Evaluation of the Federal University of Juiz de Fora.

b) The sample: The school sample is based on the 2003 Education Census, and takes as its starting point all elementary schools located in the five cities chosen for the study. These cities are Rio de Janeiro, Belo Horizonte, Campinas, Bahia and Campo Grande, representing state capitals from three of the country's five major regions--the Northeast, Southeast and Centre west. The exceptions to this rule were the exclusion of *multiseriada* schools (the single-teacher schools with multi-age classroom groups), schools with *classes de aceleração* (catch-up classes), schools with night classes, very small schools with less than 20 children and rural schools. The sample universe ended up with 3.097 schools, 7.699 classes and 205.476 pupils. The sample of 308 schools, with approximately 60 in each of the five cities, was structured according to school system (17 explicit strata), school size (<3 classes/>3 classes) and socio-economic level of pupils (quartiles) (8 implicit strata). In those cities without SES data for each school, a proxy measure, based on an indicator of school infrastructure, was employed. Contacts with the sample schools, involving individual and group meetings and the supply of information regarding the nature of the research, have emphasised the need to establish long term partnerships between the schools and the university. It is expected that over the course of the GERES project, the school will receive not only reports but will engage in training activities organized by the university.

c) The schedule of the study: Tests of Maths and reading skills will be applied once a year with the exception of the first year, 2005, in which there will be an additional application at the beginning of the school year in order to establish a skill base-line for the cohort of pupils taking part in the study, as shown in Table 1. At different times over the following four year period, researchers will apply the contextual instruments comprised of school principal questionnaire, teacher questionnaire, pupil questionnaire and parent questionnaire. Pupil registration and other information will be collected annually with the authorization of both school and family.

Table 1. GERES Instrument Application Schedule, 2005-2008

Year	Instrument
2005 (March)	Tests
	School equipment/resources questionnaire
	School principal questionnaire
	Pupil files
2005 (November)	Tests
	Teacher questionnaire
	Mother (or responsible) questionnaire
	Pupil files
2006 (November)	Tests
	Teacher questionnaire
	Pupil files
2007 (November)	Tests
	Teacher questionnaire
	Pupil questionnaire
	School equipment/resources questionnaire
	Pupil files
2008 (November)	Tests
	Teacher questionnaire
	Pupil files
	Pupil questionnaire

d) The cognitive instruments: The matrices for the development of the Portuguese language (Reading) and Maths tests were formulated by experts from the Centre for Literacy, Reading and Writing of the Federal University of Minas Gerais and by Maths specialists under the coordination of the Centre for Educational Assessment of the Federal University of Juiz de Fora. The need to apply the tests to seven year olds, in only their second year of literacy training, required the invention of a new methodology of test construction and application, recently tried out during the pretest of the cognitive instruments in a sample of schools in Rio and Juiz de Fora. The chosen items obey Item Response Theory parameters and the tests designed so as to permit the elaboration of a single scale of pupil competence on which the learning growth of each pupil can be plotted.

e) The contextual instruments: The only instruments to be designed so far are the school principal's questionnaire and the school equipment/resource questionnaire.[3] The principal's questionnaire covers the following themes: school climate, personal and educational characteristics, work conditions, school organization, academic climate and funding. Each theme is broken down into the component parts or constructs shown to be of importance by previous local or foreign research. The format for the questions for each construct is derived from 10 different questionnaires used by different state or national education evaluation programs over the past eight years. The school equipment/resources questionnaire will provide a complete inventory of the existence, use and state of repair of school buildings and equipment as well as of school funding mechanisms and financial resources.

For the fourth objective, to identify those school characteristics that increase pupil self-esteem and motivation for learning, the research will test the use of one or more instruments designed to measure aspects of pupil self-esteem, achievement motivation, academic self-concept or self-estimate of ability in an attempt to identify those school characteristics most associated with high and low

[3] Another advantage of the longitudinal research design is that not all the instruments need to be designed and applied at the same time.

values on each of these non-performance outcomes of schooling. Also to be designed is the case-study component of the program. By identifying outlier schools on the basis of data generated during the first two waves of test application, and utilizing in-depth methods such as classroom observation in a sub-sample of these outlier schools during the 2006 school year, the researchers hope to improve and diversify the instruments to be used in the following waves of test and questionnaire application.

From the beginning it has been the researchers' intention to promote discussion on the need to promote longitudinal research, disseminate information on the design and progress of the GERES project in the cause of academic transparency and to regularly inform policy-makers regarding the outcomes of each wave of test and questionnaire application. To this end, the researchers will organize regular events as well as make research reports available both in printed version and on the GERES website.

REFERENCES

Albernaz, A., Ferreira, F. and Franco, C. (2002). Quality and equity in lower secondary Brazilian schools. *Pesquisa e Planejamento Económico, IPEA, 32* (3).

Comboni, J. (1979) *La escuela como determinante de los resultados escolares em Bolívia*. La Paz: Universidad Católica Boliviana

Espósito, Y.L., Davis, C. e Nunes, M.M.R. (2000). Sistema de Avaliação do Rendimento Escolar – O modelo adotado pelo estado de São Paulo. *Revista Brasileira de Educação, n. 13*, pp.25-53.

Franco, C., Fernandes, C., Beltrão, K., Soares, J.F., Barbosa, M.E. and Alves, M.T.G. (2003). O Referencial Teórico na Construção dos Questionários Contextuais do SAEB 2001. *Estudos em Avaliação Educacional*. São Paulo, no.28, pp.39-71

Franco, C., Sztajn, P., e Ortigão, M.I. (2004). *Mathematics Teachers, Reform and Equity: results from the Brazilian National Assessment*. Texto para Discussão. LAEd, PUC-Rio.

Lee, V., Franco, C. e Albernaz, A. (2004). Quality and Equality in Brazilian Secondary Schools: A Multilevel Cross-National School Effects Study. Paper presented at the 2004 Annual Meeting of the American Educational Research Association, San Diego, CA.

MEC (2003) *Qualidade da Educação: uma nova leitura do desempenho dos estudantes da 4a série do Ensino Fundamental*. Ministério da Educação/INEP, Brasília.

Muñoz-Izquierdo, C. and P. Rodriguez. (1976). *Factores determinantes de los niveles de rendimiento escolar, asociados con diferentes caracteristicas socioeconómicas de los educados*. México: CEE-ECIEL.

Murillo Torrecilla, F. J. (2003). Una Panorámica de la Investigación Iberoamericana sobre Eficacia Escolar. *Revista Electrónica Iberoamericana sobe Calidad, Eficacia y Cambio em Educación, 1*(1), http://www.ice.deusto.es/rinace/reice/vol1n1/Murillo.pdf

Schiefelbein, E. and C. Clavel. (1977). *Stability Over Time of Educational Input-Output Relationships*. PIIE-Departamento de Economía de la Universidad de Chile, Programa ECIEL

Soares, J. F. and Alves, M.T.G. (2003). Desigualdades Raciais no Sistema Brasileiro de Educação Básica. *Educação e Pesquisa, 29*, pp. 147-165

Soares, J. F., César, C.C., and Mambrini, J. (2001). Determinantes de desempenho dos alunos do ensino básico brasileiro: evidências do SAEB de 1997. in C.Franco (org). *Promoção, Ciclos e Avaliação Educacional*. Porto Alegre: ArtMed Editora.

Soares, J. F.; Mambrini, J.; Pereira, L.R.; Andrade R. J. (2004). *Fatores associados ao desempenho em língua portuguesa e matemática: a evidência do SAEB-2003*. Relatório Técnico. Belo Horizonte: Laboratório de Medidas Educacionais, Instituto de Ciências Exatas, Universidade Federal de Minas Gerais, 74p.