

POLICY BRIEF -No. I

Learning and growth models

KEY TOPICS

A policy on quality of education was officially presented in Guatemala in November of 2006. This policy required measurement of educational achievement as a means to tapping the effectiveness of schools, the main aim of the overall efforts of the Ministry.As time passed, results from the assessment continued to demonstrate the low achievement of pupils as shown in Figure 1 (Rojas in Prensa Libre, 2013). However, these results are associated to country characteristics that have developed slowly and have considerable impact on the ability of schools to provide an education of quality.Therefore, a more sensitive measure is now required, not of the

status condition of schools in a single point in time, but of their progress as actions are implemented by the Ministry. It is necessary to identify the changes that have occurred, either positive or negative, and their association to other contextual variables. This research presents a preliminary growth model measuring system, by means of which it will be possible to determine the progress of students living in the Western Highlands of Guatemala

Figure I

Results in Education

Results of Educ public a	from math an ation compuls and private sec	d reading orily to l tors, ref	g assessment high school g lect little imp	s, made by the raduates from t rovement ever	Ministry the y year.
Costs The Directorate of Evaluation and Educational Research (DIGEDUCA) spent in 2012, Q1 million 513 thousand 288.70 in evaluating 137 thousand 446 high school graduates					
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2008 2009 2010 2011 2012		3.49 1.95 5.06 7.48 7.3	% 2008 % 2009 % 2010 % 2011 % 2012		11.10% 7.38% 22.39% 23.67% 24.47%
Number of students assessed by specialization					
fear	Bachillerato	Perito	Magisterio	Secretariado	lecnico
2008	47.12%	22.28%	21.89%	8.71%	0.00%
2009	50.92%	25.55%	14.59%	8.91%	0.02%
2010	50.91%	26.16%	14.65%	7.48%	0.86%
2011	48.77%	25.86%	18.24%	6.27%	0.86%
2012 Evente: D	48.35% Directuca Publicado e	22./1% n Prensa Liby	22.54% re. 14 de junio del 2	5.52%	0.88%
rounte. D	ngeouca. Ir ublicado e		e, i i de janio del z	015.	
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CONCEPT OF GROWTH

Interestingly, the definition of growth is not obvious. Perhaps one of the most complete definitions of growth is the one provided by Castellano and Ho: "Contrary to achievement, growth describes the academic performance of a student or group of students at two or more points in time" (Ho & Castellano, 2013, p. 13). Achievement, on the other hand, describes performance at a single point in time (Ho & Castellano, 2013, p. 12). From this definition of growth, the interpretation of performance that is made for a particular year is compared with performance of previous years (D. Betebenner, 2009, p. 43). To refer to growth, change or improvement must be demonstrated over time by the same individual or cohort. Therefore, an

example of achievement that is not growth, refers to an increase in scores shown for different grades the same year (i.e., first grade with an average of 80 points and the second grade with an average of 83 points). Slightly different, when an increase in scores in the same grade for different years is reported (i.e. 1st grade with an average of 80 points in 2012 and 1st grade with an average of 83 points in 2013), we would be talking about an improvement over time, but no growth, as was the case presented in Figure 1.

Castellano and Ho define a growth

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model as a "collection of definitions, calculations or rules that summarize student performance in a span of two or more time points and is compatible with interpretations about students, their classrooms, their teachers and their schools "(2013, p. 18). The fact that in Guatemala results are reported over the years does not imply growth or learning; consequently interpretations of school efficiency can be questioned. In other words, until now the country knows what percentage of students achieve the performance standard each school year. However, we do not know which students learn more and are closing the equity gap in education. Moreover, when referring to growth, it is important to define growth compared to what. DePascale (2006) defined different ways of conceiving academic growth of students: I) Growth relative to self, 2) Growth relative to others, and 3) Growth relative to the standard. The first refers to whether a student reads more at the end of the year than he or she did earlier in the year. This was defined by DePascale (2006)



Growth relative to self as "growth in relation to self" or the gains model, in which the basic idea is to get the difference between the measuring scale at two points in time, for example at the end of the year minus the beginning of the year. This model was also identified by Ligon (2008) as the student's ability to "move toward a higher point" on a

scale. The second relates to how a student progresses in relation to his peers. In which case, the improvement is interpreted normatively. This was defined by DePascale (2006) as "growth relative to others", or "move to a higher extent than their peers" (Ligon, 2008). At the present time, a normative model used largely is the Student Growth Percentile Model or SGP (Betebenner, 2008). Finally, growth can be defined as the closeness to the standard or being on track to achieving the standard (Ligon, 2008). This approach is known as the "growth relative to a standard" (Betebenner, 2009; DePascale, 2006). The basic idea of this model is to obtain the difference between student performance and grade level at two points in time.

PROFILES OF GROWTH

Several growth models have been developed by American academics in response to the mandate to include growth in accountability systems of the United States (Goldschmidt, Choi, & Beaudoin, 2012;



Ho & Castellano, 2013; Ligon, 2008). All these models were constructed to demonstrate growth based on different statistical foundations, different questions about effectiveness of interventions, and different interpretations. Having emerged in a peculiar accountability system (Linn & Betebenner.

Growth relative to others

2009), the decision to adopt any of these models depends on factors related to: I) the accountability question that the system is trying to solve, 2) the available data, and 3) the consequences associated with the results. However, since the models were conceived, it was intended that they had a transparent calculation that could be explained to teachers and educational actors. Thus, that results could be translated into specific objectives in teachers' plans. Therefore it should have a reporting metric similar to the one used under an achievement system.

In this paper we present the recently introduction of growth models in the accountability system of



Growth relative to a standard

Guatemala. One reason to include growth models in the current reporting system is to move away from reports of achievement and failure to progress reports or learning each year. It is important to say that large-scale assessments in Guatemala are

low impact; i.e. they are not tied to consequences for students, teachers or schools. However, reports of achievement and failure have created concern in the educational authorities and the general public. Therefore, in addition to deciding the choice of the growth model, it is necessary to establish a reporting system that teachers and other stakeholders understand and translate into concrete tasks that students achieve in the course of a school year. Thus, this project created growth profiles to address this issue. A growth profile is a summary that provides concrete descriptions of growth based on information from different growth models: 1) the gains model (DePascale, 2006), which describes growth relative to oneself, 2) the students growth percentile model- SGP (Betebenner, 2008), which describes growth compared to others, 3) a categorical model (Ho & Castellano, 2013), which describes growth related to the standard and 4) the growth model with respect to items that describes the different skills of children at two or more points in time. The four selected models provide descriptions of growth under different perspectives and correlate with each other. The model calculations were implemented using the national assessments for elementary, applied at the beginning and end of a school year in two languages (Mayan and Spanish). Specifically, first, second, third and fourth grade students in five departments of the country (Totonicapán, Quiché, Quetzaltenango, San Marcos and Huehuetenango) were assessed under the coordination of USAID Educational Reform in the Classroom in 2013. The following is an example of a student growth profile:



María is a second grade student who turned 10 in 2013. She is Mayan and she is in Miss [206] classroom of school [09-13-0375-43]. At the beginning of the year she could only answer 9 items correctly in the national reading assessment for first grade in Spanish. However, by the end of the year she answered 13 correctly, which represents a gain of 4 points, and a 0.924 progress in the ability scale. An example of the type of items she can answer now is finding the main character in a three-sentence story. This item is harder than she could do at the beginning of the year where she could only read single-sentence items. By the end of second grade, she achieved first grade reading standard. In relation to her peers with the similar ability at the beginning of second grade, she has made substantial progress; she performed better than 71% of her peers. She made no progress in reading in K'iche' (Mayan Language).

The previous growth profile is typical of the region where the study was conducted in Guatemala (Western Highlands). In general, students learn, but progress is minor in the school year. In fact, many students (around 30%) decline in ability rather than growing. Most students are a year behind regarding grade standard. And very few show progress in the Mayan languages of the country. In 2015, USAID Lifelong Learning project will start a longitudinal study in the same region that will complement this study about learning to read described in this policy brief.

IMPLICATIONS

In Guatemala, there are at least four practical and policy implications: 1) building a system that allows collecting large-scale assessment information at least twice for each student, including the creation of new assessments for grades where no assessments are available yet, 2) teacher interventions are target on the basis of students' results, taking into account regional languages, 3) combining growth models that are highly correlated with each other explain growth under different stakeholders' perspectives, and 4) there is an emphasis on informing significant results about learning to read to education professionals.

The first implication requires a system for collecting longitudinal data in Guatemala. The following requirements identified in the literature with respect to creating longitudinal data systems in different US states are described below:

• Unique identifiers to link individual student records. One of the crucial aspects of a longitudinal data system is creating unique identifiers of students. In Guatemala, the Ministry of Education already has created a system of unique identifiers for students. Furthermore, the country is in the process of providing personal identification documents (DPI) for children under 18 years.

- Coordination with other entities that collect information from students. Another important aspect is to coordinate with other entities that collect information from students, in order to associate such information to growth.
- Standardized electronic records. According to Clements (2007), in longitudinal studies it is good practice to create a dictionary of standard variables containing standard variable identifiers, descriptions, numerical coding attributes, among others. This dictionary allows a transparent process of database creation and manipulation for analysis.
- Identifiers of students who move schools. Finally, Clements (2007), suggests creating a system to identify students who are mobilized between schools. By adopting a model of longitudinal data collection, this issue is crucial in tracking students, and ascertaining the possible reasons for dropout, repetition or mobility.

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USAID Lifelong Learning offers the first of a series of policy briefs whose main objective is to disseminate key issues to achieve quality education in the classroom, based on research and evidence. After exposing researched information, these summaries will present policy options that may be useful to decision makers in education.

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