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Regional Bureau for Education in
Latin America and the Caribbean

Executive summary



THIRD REGIONAL COMPARATIVE AND EXPLANATORY STUDY

Initial background information

LATIN AMERICAN LABORATORY FOR ASSESSMENT
OF THE QUALITY OF EDUCATION

————— **July, 2015** —————

Preface

The Latin American Laboratory for Assessment of the Quality of Education (LLECE) has conducted the Third Regional Comparative and Explanatory Study (TERCE), which applied standardized assessment exams to elementary students in different subject areas.

TERCE provides information about effectiveness, a key dimension of the quality of education, and it also recognizes the gap in the level of learning achievements among students from different backgrounds.

The present report places emphasis on the results by performance level and on the analysis of factors associated with learning. This information is fundamental, as it widens the scope of the evaluation to central issues related to the learning process, beyond the traditional evaluation focused on student performance. TERCE takes into account elements of context, such as community, families, and students, factors that significantly influence the level of academic achievement that students reach.

The results associated with performance levels provide information about what students know and are capable of doing in the evaluated disciplines. This is a valuable contribution for directing pedagogical work and teacher action, allowing for reflection on knowledge of student populations and outstanding challenges to learning.

The associated factors represent a key element for the interpretation of the results in the socioeconomic context in which learning takes place. The conceptual foundation of the design of TERCE is the Context-Input-Process-Product model (CIPP), according to which learning depends on the specific social contexts, on the human resources and materials of the school, and especially, the processes that take place in the classroom and in educational establishments.

The success of a study like TERCE is measured through its impact on educational policies. UNESCO trusts that the findings and the conclusions of this study will be useful, so that countries may know the level of their learning achievements and develop policies that improve their educational systems.

TERCE is characterized by following a model of participative construction. It has been a collective effort that has involved teams, organizations, and regional and national authorities. The countries involved have participated in all decisions in the implementation phase and in the activities carried out, as well as in the design of the assessment instruments and their application, with technical assistance by institutions and experts coordinated by OREALC/UNESCO Santiago.

In the name of UNESCO and in my own, I would like to express my gratitude to all those that have been involved for their contribution to the completion of TERCE and its reports.

Jorge Sequeira
Director

Regional Bureau for Education in
Latin America and the Caribbean
OREALC/UNESCO Santiago

General introduction

Context

The Latin American Laboratory for Assessment of the Quality of Education (LLECE) came into being in 1994 as a network of entities dedicated to the measurement and assessment of educational systems in Latin American countries, coordinated by a team from the Regional Bureau for Education in Latin America and the Caribbean of UNESCO (OREALC/UNESCO Santiago), which acts as the technical coordinator.

Since its creation, LLECE has been formed as a reference and regional framework for agreement and cooperation among countries in the area of educational assessment, and as a source of technical support and training for the teams responsible for the national systems of measurement and assessment which are a source of access to information and databases at the disposal of the countries to promote the development of education policies based on empirical evidence.

Within this framework of action, LLECE has developed three versions of its Regional Comparative and Explanatory Study. In 1997, the first study, named PERCE, was applied in 12 countries. This study evaluated mathematics and reading in third and fourth grades of elementary education. The second study (SERCE) was applied nine years later, in 2006, and evaluated the subject areas of mathematics and reading in third and sixth grades, and natural sciences in sixth grade. The third study was applied in 2013, evaluating the same subject areas and grades as SERCE.

General focus of the LLECE studies

The evaluation focus of LLECE considers the quality of education as a multidimensional concept, in which learning achievement is an essential element, but not the only one. According to UNESCO (2007), quality education also refers to variables such as efficiency (good use of resources), equity (distribution of educational benefits), relevance (that it responds to the necessity of society), and pertinence (that it responds to the needs of students). In the framework of this conceptualization, learning achievement has an important place as an indicator of quality. The monitoring of said achievement, in how it provides disaggregated information in relation to the results achieved by different groups of students, has been crucial in identifying shortcomings in equity, in particular when the variable of belonging to indigenous ethnicities and the gender of the student are considered.

During the last twenty years, the greater part of the countries in the region has experienced significant progress in key aspects, such as global development, economic growth, and - in smaller measure - the reduction of poverty, all of which generates a favorable context for progress in education. However, the persistence of elevated levels of inequality and poverty, and the high proportion of the population living in rural areas continue to present additional difficulties to the expansion of quality education in the greater part of the region.

The region has achieved significant advances in terms of literacy and scope of its educational systems, but important outstanding challenges persist in terms of quality and equity. According to SERCE results, implemented in the year 2006 in 16 countries of Latin America and the Caribbean¹, 52% of children that were enrolled in sixth grade in participating countries were found to be at basic performance levels.

¹ Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, the Dominican Republic, and Uruguay. The Mexican state of Nuevo León also participated as a separate entity.

TERCE - Third Regional Comparative and Explanatory Study

On this occasion, OREALC/UNESCO Santiago presented the results of the Third Regional Comparative and Explanatory Study (TERCE), implemented in the year 2013, in cooperation with the national coordinators of the participating countries². The main purpose of this study was to evaluate the quality of education in terms of learning achievements in the participating countries in Latin America and the Caribbean, and identify factors associated with this achievement. In this way, TERCE not only provides a diagnostic assessment of the situation based on learning achievements, but it also seeks to contribute to the improvement of education under the supposition that understanding the associated factors helps in the development of public policies and the revision of educational practices.

TERCE evaluated learning in the subject areas of reading, writing and mathematics in third and sixth grade elementary students, and natural sciences in sixth grade.

Development of the study

Preparation of TERCE began in the year 2010, and in particular, at the XXVI Meeting of National Coordinators, which took place in the city of Brasilia (13th and 14th of December). Since then, the technical coordination of LLECE, in collaboration with the national coordination and with their partnering implementers, the Centro de Medición (MIDE UC) of the Pontificia Universidad Católica de Chile and, from 2012, the Centro de Políticas Comparadas en Educación of the Universidad Diego Portales (CPCE-UDP) began the implementation of this project according to the following phases:

TABLE 1: SCHEDULE OF MAIN ACTIVITIES

Year	Task	Coordinating Institution	Implementing Institution
2011	Curricular analysis	OREALC/UNESCO Santiago	JCEFS (Instituto Colombiano para el Fomento de la Educación Superior)
	Development of items		MIDE UC, countries
2012	Framework of associated factors		MIDE UC, CPCE-UDP
	Development of questionnaires		CPCE-UDP
	Sample design		OREALC/UNESCO Santiago
	Software (administration, acquisition)		IEA (International Association for the Evaluation of Educational Achievement)
	Pilot application		MIDE UC, CPCE-UDP, countries
2013	Definitive application		MIDE UC, CPCE-UDP, countries
2014	Analysis and development of main reports		MIDE UC, CPCE-UDP OREALC/UNESCO Santiago

² See annex 1 for national collaborating teams.

SIXTEEN EDUCATIONAL SYSTEMS, THAT IS, 15 COUNTRIES PLUS A SUBNATIONAL STATE, PARTICIPATED IN TERCE. THE PARTICIPANTS WERE:

- Argentina
- Brazil
- Chile
- Colombia
- Costa Rica
- Ecuador
- Guatemala
- Honduras
- Mexico
- Nicaragua
- Panama
- Paraguay
- Peru
- The Dominican Republic
- Uruguay
- The Mexican state of Nuevo León

TERCE fundamentally seeks to respond to two research questions:

- 1 What is the general level of **academic performance** of students in elementary school in the subject areas of reading, writing, mathematics, and natural sciences in the participating countries?
- 2 What is the relationship between academic performance and other variables (**associated factors**), linked to students and their families, to teachers and classrooms, and to schools and their management?

Corresponding to these two core elements of research, TERCE used two types of data collection instruments to achieve its goal: **learning assessment exams and context questionnaires**.

For the creation of tests, item development workshops were designed with the participation of the countries that form part of the study³. These workshops had the double objective of contributing to the development of necessary instruments and offering technical training to national teams. A first step towards the development of these instruments consisted of a revision of the curricular frameworks of participating countries, which was headed by the Instituto Colombiano para la Evaluación de la Educación (ICFES)⁴. This activity allowed for the identification of common elements in the curriculum, and as such, for the development of an exam structure apt for the measurement of the quality of education at the regional level.

The **context questionnaires** were developed by taking into consideration the theoretical framework of the study, based on an exhaustive literature review concerning the factors that can affect learning achievement at the elementary level. TERCE had questionnaires for students, families, teachers, and principals (see table 2). The information requested through these instruments made an analysis of associated factors regarding the main characteristics of participating educational systems possible.

³ These workshops were conducted in Bogotá, Colombia, from the 25th to the 27th of May, 2011. On this occasion, specialists from the participating countries worked in groups by subject area, carrying out parallel sessions of reading, writing, mathematics, and natural sciences.

⁴ This work culminated in the Third Regional Comparative and Explanatory Study document: Curricular analysis (OREALC/UNESCO Santiago, 2013).

TABLE 2: QUESTIONNAIRES ON ASSOCIATED FACTORS:

Actor	Instrument	Objective
3 rd Grade Students	Student Questionnaire	To research the personal characteristics of students and about their access to educational material inside and outside of the classroom. To understand their relationship with classmates and teachers, about the activities that they participate in outside of school, both academic and recreational.
6 th Grade Students	Student Questionnaire	To understand personal characteristics, of their homes and families, and of their schools, to explore the relationship with their teachers and their perceived attitudes. Additionally, it sought to identify their activities outside of school, both academic and recreational in nature, and the use of ICT (goal of use, frequency, and intensity).
Families	Family Questionnaire	To research familial characteristics, homes, and neighborhoods, as well as the availability of educational resources (books), attitudes towards reading in the family and the child's conduct (school attendance, frequency, and study time at home, etc). It also collected information about family involvement in the learning process and about expectations for academic development with regard to the children.
Teachers	Teacher Questionnaire	To understand personal characteristics and background occupational information of teachers, and examine their work as educators, in addition to their expectations pertaining to students, the school environment, leadership, and school management.
Principals	Principal Questionnaires	To collect information about their personal characteristics, the environment and infrastructure of the school, and about the school's management.

Effective sample

The sample design of TERCE makes it possible for the results of the study to be representative of two populations within the educational system: students that are in third and sixth grade in the participating countries. The analyses that give an account of the results from the countries and the region were carried out with the following quantity of students:

TABLE 3: EFFECTIVE SAMPLE OF STUDENTS BY EXAM AND COUNTRY

Country	3rd Grade Reading	6th Grade Reading	3rd Grade Mathematics	6th Grade Mathematics	6th Grade Science	3rd Grade Writing	6th Grade Writing
Argentina	3,655	3,658	3,751	3,639	3,663	3,632	3,659
Brazil	3,254	2,900	3,343	2,983	2,986	3,908	3,583
Chile	4,751	5,056	4,709	5,044	5,029	4,754	5,067
Colombia	4,018	4,343	3,975	4,308	4,325	4,028	4,347
Costa Rica	3,427	3,490	3,428	3,520	3,520	3,436	3,496
Ecuador	4,631	4,842	4,642	4,818	4,820	4,621	4,826
Guatemala	4,060	3,891	4,282	4,056	4,070	4,112	3,918
Honduras	3,743	3,788	3,870	3,880	3,886	3,651	3,686
Mexico	3,465	3,554	3,543	3,618	3,622	3,456	3,545
Nicaragua	3,513	3,470	3,810	3,726	3,741	3,537	3,511
Panama	3,283	3,486	3,414	3,413	3,548	2,764	3,484
Paraguay	3,123	3,175	3,271	3,222	3,231	3,274	3,197
Peru	4,946	4,739	5,038	4,789	4,801	5,003	4,745
The Dominican Republic	3,504	3,588	3,757	3,661	3,669	3,652	3,605
Uruguay	2,663	2,799	2,728	2,799	2,803	2,672	2,809
All Countries	56,036	56,779	57,561	57,476	57,714	56,500	57,478
Nuevo León	4,083	4,171	4,129	4,197	4,207	4,072	4,182

Note: The total number of students corresponds to the total number of cases, without a supplementary sample, used for the analysis once the exclusion criteria of TERCE were applied.

It is important to note that, in contrast to SERCE, in TERCE all countries participated in the natural sciences exams, reflecting the importance of this discipline in the evaluative context and in the education that children and youth receive in educational systems throughout the region.

Innovative aspects

The experiences accumulated by LLECE through the years have enabled an understanding of the needs of educational assessment in the region, and in this way work on the implementation of innovations so that its studies provide relevant information for the design of public policies. One of the innovations that the laboratory has implemented since the application of SERCE (2006) has been the evaluation of writing skills. The ability to organize and coherently express ideas through a written text is a fundamental tool for human and professional development in the 21st century, and is also a reflection of the quality of the education that children receive in the region. For this reason, TERCE also evaluates this dimension.

The LLECE also sought to adapt its evaluations to the social and cultural changes that can affect learning. For this reason, it was decided in the application of TERCE to include in the associated factors questionnaire a set of questions that measures the effect that information and communication technologies have on student learning. It is evident that the intensity of the use of these technologies has been greatly increasing and it was necessary to unveil how they relate to learning processes.

Finally, in their effort to be a study founded in educational realities of the countries and of the region, TERCE allowed for participants to incorporate a specific national module in the context questionnaires. These modules allowed for an evaluation of the aspects that are of particular interest to each country. The countries that implemented these modules were Costa Rica, Ecuador, Guatemala, Paraguay, and Uruguay.

Presentation of the TERCE results

The results of TERCE are organized into two booklets. The first one presents the learning achievements of students in different grades and exams applied through a point scale and distributions according to performance levels that indicate what students know and are able to do at each of those levels. The second booklet provides information about the factors associated with learning achievements and has three central chapters, in each of which variables corresponding to the following are analyzed: characteristics of students and their families, characteristics of teachers, pedagogical practices and classroom resources, and characteristics of schools that relate to learning. Both booklets include background information to better understand the results, in addition to the respective executive summaries, introductions, and conclusions.

Performance achievements

Mean scores on the point scale have the regional average of 700 points as a reference. From this score and the associated standard error, it is possible to identify three country groupings according to whether their averages were significantly below, equal to, or significantly higher than this reference score. In general, it can be observed that countries tended to remain within the same group, regardless of the exam and grade evaluated, that is, a country with a score above the regional average would generally have the same result for all exams and grades.

With regard to performance levels, the performance of students on the reading exams tended to be higher than on the mathematics and natural science exams. Performance levels also evidence the necessity to promote more advanced learning achievement so that a higher proportion of students fall into higher performance levels, being that currently there is a strong concentration of students in the lowest levels (I and II) on all exams. The consolidation of more complex learning will not only improve academic performance for children in the region, but it will also provide a greater amount of tools so that they may interpret texts, solve complex mathematical problems, and develop scientific thinking in order to understand the world around them.

Factors associated with learning achievement

The factors associated with student achievement are studied through different multilevel models, where the relation between different variables and the results of the exams are studied, before and after considering the socioeconomic level of the students attending schools.

The analysis of associated factors demonstrates that at the student level there is a positive relationship between achievement and the socioeconomic level of families, the support of parents at home to monitor learning and bolster reading, as well as attending preschool education. The school absence and belonging to an indigenous group are associated with lower academic achievements. In some countries, gender differences are recorded, wherein girls tend to have higher scores on reading exams, and boys tend to have higher scores in science and mathematics. At the classroom level, the attendance and punctuality of teachers, the availability of notebooks and books, the classroom environment, and teacher practices that tend to the needs of students are positively related to learning results. The analysis of schools allows for the affirmation that school systems in the region are not socioeconomically inclusive, as it is very unlikely that in the same school two students of different social origin would be found. Violence in the school environment has a negative relationship with learning achievement, while school resources and its infrastructure maintain a positive relationship with learning.

Next steps

In the months after July, 2015, and as part of the activities of continuous diffusion of TERCE, we have the publication of other products of the study planned, such as the publication of Contributions for Learning in evaluated subject areas and the publication of a document with policy recommendations based on the results of associated factors.

LLECE -TERCE: MILESTONES	PLANNED DATE
Publication of the technical report	August, 2015
Publication of the series of documents "Aportes para la Enseñanza" ("Contributions for Education")	September, 2015
Publication of the document "Recomendaciones de políticas públicas sobre la base de los resultados del TERCE" ("Public policy recommendations based on the results of the TERCE")	October, 2015

Although the region showed significant progress during the last years, there is still much to work on in primary education to improve learning in the curricular areas of reading, writing, mathematics, and natural sciences. This diagnostic assessment allows for a profound look into its preliminary findings and invites suggestions about possible interventions at the practical and educational-political level in order to execute the required improvements.

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