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Third and sixth grade teachers in Latin America and the Caribbean:

*Characteristics, perceptions
and relationship with student
learning achievement*



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UNESCO Santiago prioritizes the gender perspective; nonetheless, in order to facilitate reading, a neutral language will be used or reference will be made to male or female gender in accordance with the literature presented.

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Latin American Laboratory
for Assessment of the Quality
of Education

OREALC/UNESCO Santiago

**Third and sixth grade
teachers in Latin America
and the Caribbean:**

*Characteristics, perceptions
and relationship with student
learning achievement*

Regional Strategy on Teachers Technical Secretariat



Credits

The development of the second thematic report of the Third Regional Strategy on Teachers Technical Secretariat and the Latin American Laboratory for Assessment of the Quality of Education (LLECE), based at OREALC/ UNESCO Santiago.

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Introduction

In accordance with the guidelines of the Education 2030 Agenda of the United Nations, the mandate of UNESCO is to continue providing services to countries and certain regions, especially in the area of transversal issues, like education quality, teachers and their student learning. Teachers are key elements in the operation of a school. Therefore, their characterization and link with their student learning are indispensable in order to understand the workforce associated to the education system of different countries in Latin America and the Caribbean. This is the reason why the Regional Bureau of Education for Latin America and the Caribbean, OREALC/UNESCO Santiago, within the context of its Regional Teaching Staff Strategy, is promoting discussion and decision-making on regional education policies in the area.

Within this framework, OREALC/UNESCO Santiago has its own follow-up mechanism that enables it to provide a diagnosis and in-depth analysis of unequal learning within the region. TERCE, the Third Regional Comparative and Explanatory Study, was carried out by the Latin American Laboratory for Assessment of the Quality of Education (LLECE), an organization that brings together 16 educational systems and is coordinated by our Office. As teachers are a key factor in the improvement of student learning, the following document addresses the issue of teaching and its direct link to student learning.

Improving education quality is a priority for the Latin American and Caribbean countries. With the attainment of universal primary education in most countries, the current challenge is to make sure that students learn at school. The level of student learning will be the factor that will improve people's living conditions, and promote socio-economic development in the region (Hanushek and Woessmann, 2012).

Teachers are a key factor for improving student learning achievement (McKinsy, 2007; Bruns and Luque 2014). Teachers are in daily contact with their students in the classroom giving them (or not) the opportunities required for learning the contents, skills and competences required for their development.

It is then relevant to know about the teachers that teach thousands of school children in the region. What is their level of training? Are they motivated with their profession? What are their perceptions regarding teaching and learning conditions in the school?



The purpose of this study is twofold: (1) to know the characteristics and perceptions of teachers which are relevant to educational policy; (2) to understand how these characteristics and perceptions relate to levels of student achievement. For this, the study answers the following questions:

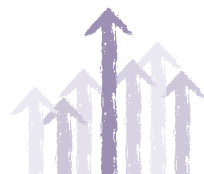
- 1. What kind of initial training do teachers receive?**
- 2. Do teachers have opportunities for professional development?**
- 3. Do teachers receive teaching support from their school leaders?**
- 4. Is there a classroom environment that supports learning?**
- 5. Is there violence in the schools?**
- 6. Are teachers satisfied with their job?**
- 7. Are teachers satisfied with their salaries?**
- 8. What are teacher expectations regarding the education level their students will reach?**
- 9. What is the achievement level of students from the same classroom?**
- 10. What do teachers think about student assessment in the classroom?**

These questions were answered with information obtained from TERCE (Third Regional Comparative and Explanatory Study) of the Latin American Laboratory for Assessment of the Quality of Education (LLECE), of the UNESCO Regional Bureau for Education for Latin American and the Caribbean (OREALC/ UNESCO Santiago).

The TERCE study was administered in 2013 in 15 countries of the region (Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, and Uruguay) and in the Mexican state of Nuevo León. The TERCE study administered mathematics, reading, writing and natural sciences tests to representative samples of third and sixth grade students at a national (or regional) level. The TERCE also collected information on the educational context through questionnaires answered by students, their families, their teachers and their principals of the participating schools. In this report, teacher replies to the Teacher Questionnaire were related with the mathematics scores of third and sixth grade students.

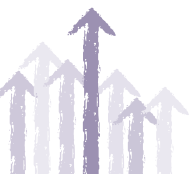
The following are the main conclusions of the study:

- The large majority of third and sixth grade students have teachers who hold a teaching degree of post-secondary education level or higher, and who declare that they have received teaching support from their school leaders. It would appear that the current challenge is the improvement of teacher training and the support received by teachers.



- Approximately fifty percent of third and sixth grade students attend schools with a favourable classroom learning climate, in other words, an environment where teachers can teach without interruptions and are able to maintain students' attention, among others. A good classroom climate is associated with higher achievement levels in almost all the countries that took part in the study.
- All countries show great differences in the achievement levels of third and sixth grade students attending the same class and taught by a same teacher. This diversity in classroom achievement levels poses an enormous challenge to teachers and to teacher training institutions. To cater to such a diversity of students requires that teachers should display a variety of teaching strategies. This is the only way to encourage learning for all.
- The large majority of third and sixth grade students have teachers that are satisfied with their jobs, although not with their salaries. This poses a challenge to attract the best into the profession and ensure their professional development.

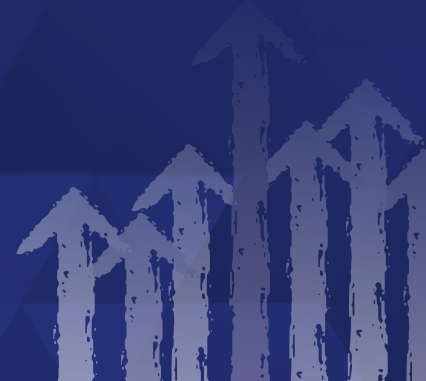
The following results are expected to contribute to an informed public debate on education quality from the perspective of the teachers from Latin America and the Caribbean region.





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Third grade results



1. What kind of initial training do teachers receive?

- Quality education requires a teacher with solid initial training. In Latin America and the Caribbean there are different views of the type of institution that should train teachers (normal school, professional training institute, or university). But, there would seem to be a consensus in the sense that a teaching career requires a teaching degree obtained from a post-secondary level study programme.
- The initial training level of third grade teachers was established by asking them which was the highest level of education completed (lower secondary, higher secondary, non-tertiary post-secondary or short term tertiary, tertiary, master's degree or doctorate), and if they held a teaching degree.
- An overview of the group of countries surveyed shows that 79% of third grade students are taught by teachers with a post-secondary or higher level teaching degree. This percentage varies from 99% in Chile to 20% in Guatemala. Four countries (Ecuador, Guatemala, Honduras and Nicaragua) are under the regional mean. For these countries, and especially for Guatemala and Nicaragua, the pending challenge is to ensure that a higher percentage of their teachers can obtain a post-secondary level teaching degree.
- When observing within the education systems, it is seen that only eight educational systems (Argentina, Brazil, Guatemala Honduras, Mexico Nicaragua, Peru and Uruguay) show mathematics scores that are statistically significant in favour of those students whose teachers hold post-secondary or higher level teaching degrees, compared with those students taught by teachers that do not hold post-secondary or higher level degrees. In four countries, there are no significant differences between both groups of students (Colombia, Dominican Republic, Ecuador and Panama). In the Mexican state of Nuevo León scores favour students whose teachers do not hold a post-secondary or higher level teaching degree.
- The absence of a clear relationship between holding a post-secondary degree (or higher) and student performance can have many causes. One is that in some education systems (Dominican Republic and the Mexican state of Nuevo León) teachers with post-secondary or higher degrees tend to teach students from a vulnerable socio-economic context (students that tend to have the lowest scores in mathematics). Another possible cause is that a post secondary or higher level teaching degree is only one of the many variables that affect learning achievement. Finally,



it is probable that the lack of a relationship between holding a post-secondary or higher level professional degree and student learning is due to the low quality of initial teacher training in the region.

GRAPH 1

What kind of initial training do teachers receive?

The purple bars indicate the percentage of third grade students taught by teachers holding a post secondary or higher level teaching degree. The lines with the yellow circle indicate mathematics test scores for students taught by teachers who do not hold a post-secondary or higher level teaching degree. The pink lines indicate the mathematics test scores of students taught by teachers holding a post-secondary or higher level teaching degree. The direction of the arrows indicates if the score differences between students whose teachers hold or do not hold a post-secondary degree (or higher) are statistically significant. The upward pointing arrow indicates that the differences are positive and statistically significant. The downward pointing arrow indicates that the differences are negative and statistically significant. The horizontal line indicates that the differences are not statistically significant.



Note: Differences for Chile, Costa Rica and Paraguay were not reported, as less than 5% of their students are taught by teachers who do not hold post-secondary or higher level teaching degrees.

(*) Countries with more than 20% cases with no information (non responses or missing data)



2. Do teachers have opportunities for professional development?

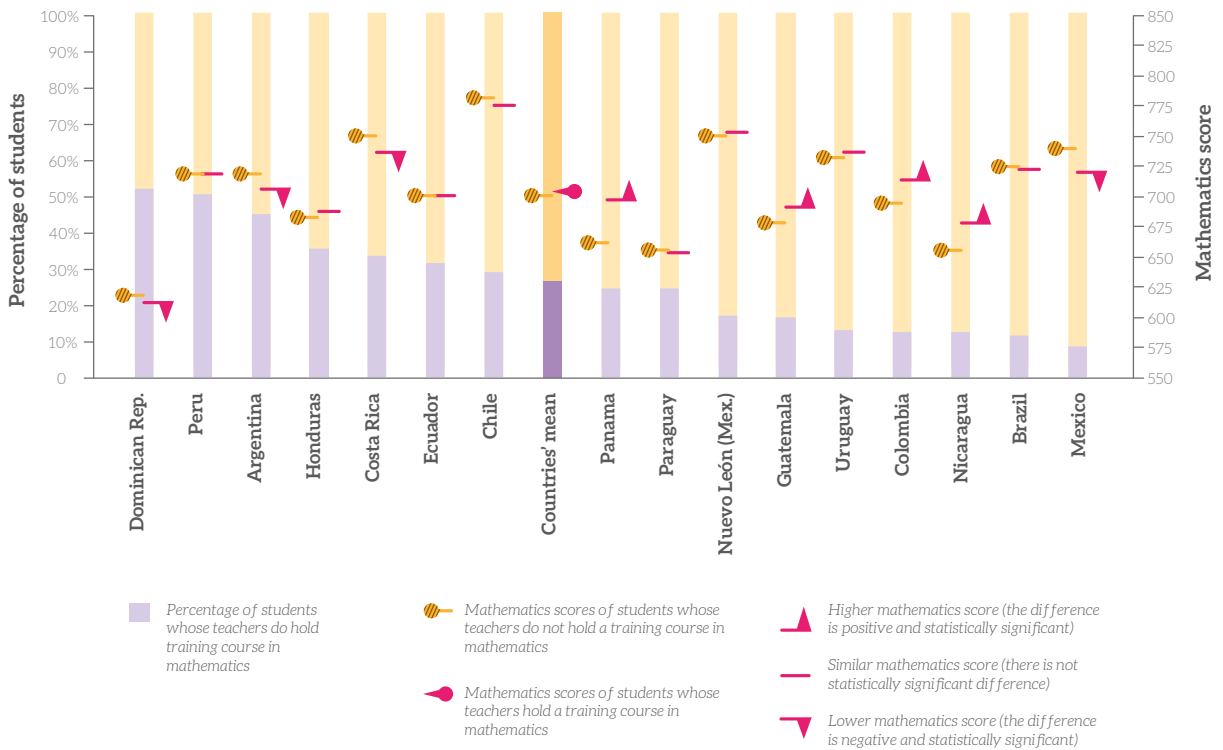
- Quality education requires teachers that can regularly update their knowledge and teaching practices. Teacher participation in training activities related to subjects taught is highly valued as a strategy to improve student learning and thus contribute to quality education.
- In order to know what is the third grade teachers' participation in training activities, they were asked if they had done a training course (60 or more hours) in mathematics in the past two years.
- 27% of the third grade students of the 15 countries included in the survey are taught by teachers who have done a mathematics teacher training course in the past two years. This percentage varies from 52% in the Dominican Republic to 9% in Mexico. In seven education systems (Brazil, Colombia, Guatemala, Mexico, Nicaragua, Uruguay and the Mexican state of Nuevo León), less than 20% of students are taught by teachers who have done a teacher training course in mathematics in the past two years.
- When comparing results from different countries, there is no clear relation between training in mathematics and student learning levels in the subject. In effect, only four education systems (Colombia, Guatemala, Nicaragua and Panama) show differences in score that are statistically significant favour of students whose teachers have done teaching courses in mathematics, compared with students whose teachers have not done so. In the rest of the education systems there are no significant differences between both groups of students (Brazil, Chile, Ecuador, Honduras, Paraguay, Peru and Uruguay and the Mexican state of Nuevo León), or differences in scores favour students taught by teachers that have not done these training courses (Argentina, Costa Rica, Dominican Republic and Mexico).
- The absence of a positive relationship between training in mathematics and student performance could be explained by the low quality and relevance of the teaching training received. In Costa Rica, it is possible that this might also be caused by the fact that training is more focused on teachers who serve students from more vulnerable socio-economic context (students that tend to have lower scores in mathematics).



GRAPH 2

Do teachers have opportunities for professional development?

The purple bars indicate the percentage of third grade students taught by teachers who have done a mathematics training course (60 hours or more) in the past two years. The lines with the yellow circle indicate the mathematics test score of students taught by teachers who have not done a mathematics training course in the past two years. The pink lines indicate the mathematics test score of students whose teachers have done a mathematics training course. The direction of the arrows indicates if the score differences between students whose teachers have or have not done a training course in mathematics in the last two years are statistically significant. The upward pointing arrow indicates that the differences are positive and statistically significant. The downward pointing arrow indicate negative and non statistically significant differences. The horizontal line indicates that there are not statistically significant differences.



3. Do teachers receive teaching support from their school leaders?

- Effective schools have leaders that exercise strong pedagogical leadership over their teachers, supporting them in the implementation of their teaching practices. This support is fundamental to guide teachers' work, to improve teaching-learning processes, and to contribute to quality education.
- In order to find out the degree of teaching support received by third grade teachers, they were asked how frequently the school leaders: (a) visits our classrooms and carries out classroom observations; (b) gives us feedback on our teaching; (c) gives us feedback on our student assessment; (d) gives us feedback on our lesson plans; (e) gives us feedback on our classroom management. Teachers who replied "once in the semester", "more than once in the semester", or "once a month" to all of these were considered to be teachers who receive pedagogical support from the school leaders. Teachers who responded "never" to one or more statements were considered teachers that received no pedagogical support from their school leaders.
- The large majority (77%) of third grade students from the 15 countries surveyed are taught by teachers that receive support from their school teaching team. This percentage varies from 91% in Paraguay to 46% in Colombia. It is only in the latter where less than half the students are taught by teachers who receive pedagogical support from the school leaders.
- Within the education systems, it is interesting to note that only seven countries (Argentina, Brazil, Colombia, Guatemala, Honduras, Peru and Uruguay) show differences in mathematics scores that are statistically significant in favour of students taught by teachers who do receive pedagogical support, as compared to those who do not. There are no significant differences in the rest of the education systems (Chile, Dominican Republic, Ecuador, Mexico, Nicaragua and the Mexican state of Nuevo León), or the differences favour students taught by teachers who receive no pedagogical support (Costa Rica, Panama and Paraguay).
- The absence of a positive relationship between receiving pedagogical support from the school leaders and student performance can be attributed to different reasons. One of these is that in some education systems (Costa Rica, Panama, and the Mexican state of Nuevo León), teachers that receive pedagogical support tend to teach students from a more vulnerable socio-economic context (where students tend to have lower scores). Another possible reason is that it is the teachers with weaker teaching skills (and who therefore have students with lower learning

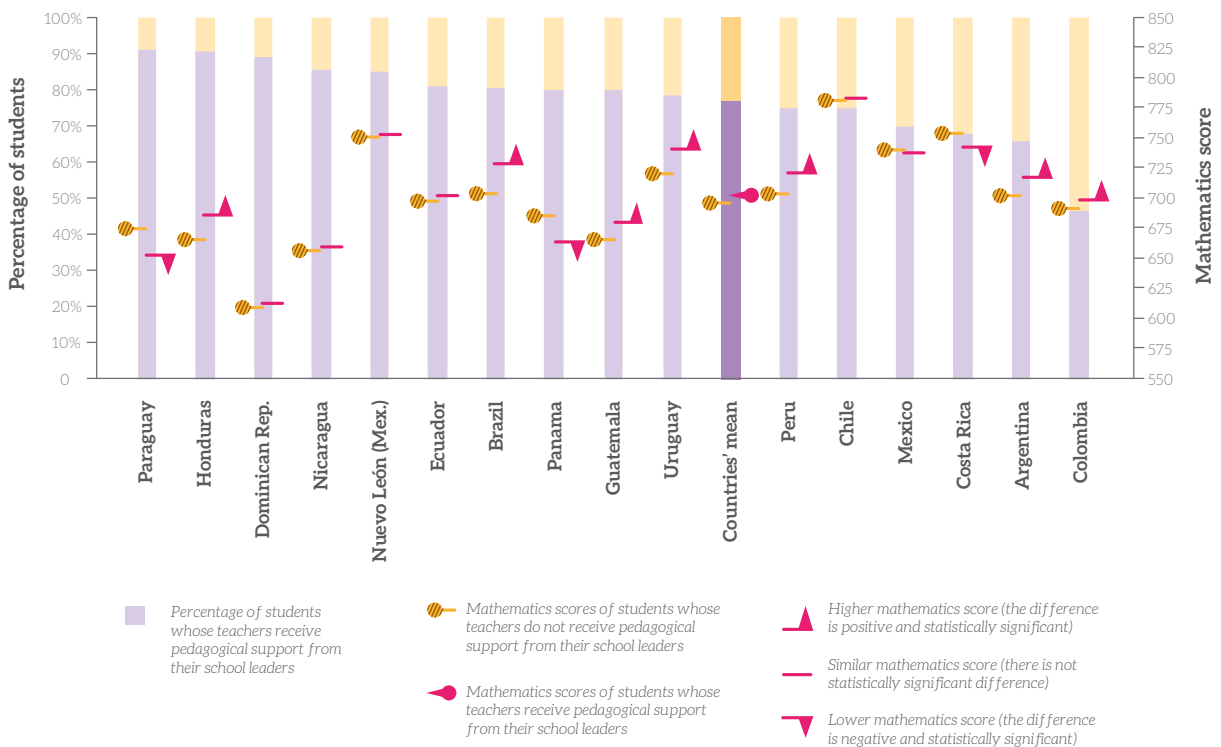


skills) who receive pedagogical support from the school leaders. A third possible reason refers to the limitations regarding a teacher questionnaire with fixed reply options. Although teachers can report if they receive different types of pedagogical support, the questionnaire does not allow to capture the quality and efficiency of the support received.

GRAPH 3

Do teachers receive pedagogical support from the school leaders?

The purple bars indicate the percentage of third grade students whose teachers receive pedagogical support from their school leaders. The lines with the yellow circle indicate the mathematics test scores of students whose teachers do not receive pedagogical support from their school leaders. The pink lines indicate the mathematics test scores of students whose teachers receive pedagogical support from their school leaders. The direction of the arrows indicates if the score difference between students whose teachers receive and do not receive pedagogical support from the school leaders are statistically significant. The upward pointing arrow indicates that the differences are positive and statistically significant. The downward pointing arrow indicates that the differences are negative and statistically significant. The horizontal line indicates that the differences are not statistically significant.



4. Is there a classroom environment that support learning?

- For students to learn in the classroom it is essential that teachers work in a classroom climate that favours learning. In other words, in an environment with friendly and respectful relationships and collaboration between teachers and students.
- To know if third grade teachers work in a classroom climate that favours learning, they were asked how much they agreed with the following statements: (a) I can teach without being interrupted; (b) students pay attention to my explanations; (c) I enjoy teaching this class; (d) students are aggressive among themselves (inverse coding¹); (e) students tend to help slower learner students; (f) students show respect for their classmates. Teachers who responded “I agree” or “I strongly agree” to all statements were considered to be teachers who worked in a classroom climate that favours learning. Teachers who answered “I strongly disagree” or “I disagree” to one or more statements were considered to be teachers who worked in a classroom environment that does not favour learning.
- Results show that approximately half of the students (57%) from the 15 countries surveyed attend classroom with a climate that favours learning. The percentages vary from 77% in Paraguay to 33% in Costa Rica.
- In almost every education systems there are statistically significant score differences favouring students who attend classes with a climate that favours learning, compared with students who study in a classroom with no such climate. No statistically significant differences are observed in only two countries (Ecuador and Honduras).
- The positive relation between classroom climate and student learning is partly mediated by the socio-economic status of students. Teachers who instruct more socially advantaged children in three countries (Colombia, Costa Rica and Peru) tend to work in a classroom environment that favours learning. This contributes to increase scores among students from different socio-economic context. The fact that students of a lower socio-economic status attend classes where it is less likely to find a classroom environment that will favour learning, poses a challenge for these countries in terms of equity.

¹ Only in this statement, the “I really agree” answers were treated as “I really disagree” replies, the “I agree” answers as “I disagree”, the “I disagree” answers as “I agree”, and the “I really disagree” answers as “I really agree”.



GRAPH 4

Is there a classroom environment support that learning?

The violet lines indicate the percentage of third grade students whose teachers work in a classroom climate that favours learning. The lines with the yellow circle indicate the mathematics test scores of students whose teachers work in classrooms with a climate that does not favour learning. The lines with pink arrows indicate the mathematics test scores of students whose teachers work in a classroom climate that favours learning. The direction of the arrows indicates if the score differences between students whose teachers work in a classroom environment that supports learning are statistically significant. The upwards pointing arrow indicates that the differences are positive and statistically significant. The downwards pointing arrow indicates that the differences are negative and statistically significant. The horizontal line indicates that the differences are not statistically significant.



5. Is there violence in the schools?

- Violence in schools is a problem that causes increasing concern in the region. School violence attempts against the physical and psychological wellbeing of the students and has a negative impact on the quality of education. Parents consider that safety in the school is an issue of maximum priority. For teachers, this condition is required to allow them to teach and focus on the teaching-learning processes.
- In order to learn about the levels of violence in schools, third grade teachers were asked if some of the following occurred in the schools during the past month: (a) A student insulted or threatened a classmate; (b) a student hit or harmed a classmate; (c) a student was left out of classmates' games or activities; (d) a student insulted or threatened a teacher. The reply options ranged from: "no, it didn't happen" (1 point), "it happened sometimes" (2 points), and "it happened often" (3 points). School violence was considered when teacher replies averaged 2 or more points. With opposite results, no school violence was considered.
- 16% of the third grade students from the 15 countries surveyed attend schools that have shown violent situations in the past month. This percentage varied from 3% in Ecuador to 32% in Uruguay.
- Nine of the education systems showed statistically significant mathematics score differences in favour of students who attend schools with no episodes of violence, in comparison with students who attend schools with episodes of violence. This is the case of Argentina, Brazil, Chile, Colombia, Dominican Republic, Mexico, Paraguay, Uruguay and the Mexican state of Nuevo León.
- Two countries (Nicaragua and Panama) showed statistically significant score differences in favour of students that attend schools with episodes of violence. In Panama, this could be caused by the fact that teachers report greater levels of violence in schools where they teach students of a higher socio-economic status (and these students tend to have higher scores in mathematics).
- These results show that levels of violence among third grade students from Latin America and the Caribbean are much lower than the high levels of youth and adult violence in some countries. This might be caused by the fact that the germs of youth and adult violence are not present in the third grade.



- When comparing violence levels among countries, we should also ask whether these are caused by real variations in the levels of violence existing in schools or to differences in the concepts of violence in different countries (what is considered violent in one country is not in another).
- Another possible explanation of the results is that it may be difficult for a teacher to know about violence among students within the school but outside the classroom, which might lead to an underrepresentation of these situations in some countries.

GRAPH 5

Is there violence in schools?

The purple bars indicate the percentage of third grade students that attend schools in which a violent episode occurred in the last month. The lines with the yellow circle indicate the mathematics score of students attending schools with episodes of violence. The pink lines indicate the mathematics scores of students attending schools with no episodes of violence. The direction of the arrows indicates if the score differences among students attending schools with or without episodes of violence are statistically significant. The upwards pointing arrow indicates that the differences are positive and statistically significant. The downwards pointing arrow indicates that the differences are negative and statistically significant. The horizontal line indicates that the differences are not statistically significant.



Note: In the case of Ecuador score differences were not reported, as less than 5% of its students attend schools with episodes of violence during the past month.



6. Are teachers satisfied with their jobs?

- Teachers' satisfaction with their work is important to motivate excellent teaching performance and retain the best in the profession. At the same time, this makes it more probable that these teachers' students will benefit from better learning opportunities in the classroom, which contributes to improve the education quality.
- In order to learn if third grade teachers are satisfied with their work, they were asked to indicate their degree of agreement with the following statements: (a) I like working in this school; (b) my work is considered valuable in this school; (c) my work makes me extremely frustrated (inverse coding²); (d) I feel satisfied with my work as a teacher. Teachers who replied "I agree" or "I strongly agree" to all statements were considered teachers that are satisfied with their work. Teachers who replied "I strongly disagree" or "I disagree" to one or more statements were considered teachers that are not satisfied with their jobs.
- Teachers from the region feel high levels of job satisfaction. In the 16 education systems surveyed, 80% or more of the students are taught by teachers who are satisfied with their jobs, with the percentage reaching 96% in Ecuador.
- However, when looking within each education system, there is no clear relationship between satisfaction with the teaching job and students' mathematics scores. There are statistically significant score differences in favour of students whose teachers are satisfied with their jobs in eight of the education systems (Argentina, Brazil, Chile, Mexico, Nicaragua, Peru, Uruguay and the Mexican state of Nuevo León), compared with the students taught by teachers that are not satisfied with their jobs. There are no statistically significant differences in the rest of the countries (Costa Rica, Dominican Republic, Guatemala, Panama and Paraguay) or the differences favour those students whose teachers are not satisfied with their jobs (Honduras).
- The fact that teachers from Latin America and the Caribbean are satisfied with their jobs is good news. However, results show that these high levels of satisfaction do not necessarily translate into high levels of student achievement. There are different possible explanations for the lack of a positive relation between teacher job satisfaction and student learning. One is that teacher job satisfaction is a necessary but not sufficient condition for improving teaching-learning processes. Teacher job satisfaction does not replace deficiencies in their pedagogical

² Only in this statement, the "I strongly agree" answers were treated as "I strongly disagree" replies, the "I agree" answers as "I disagree", the "I disagree" answers as "I agree", and the "I strongly disagree" answers as "I strongly agree".



practices. Another possible explanation is that, given that most teachers are satisfied with their jobs, there is not sufficient variability in the data to explain the difference in the mathematics scores of their students.

GRAPH 6

Are teachers satisfied with their job?

The purple bars indicate the percentage of third grade students taught by teachers who are satisfied with their jobs. The lines with the yellow circle indicate the mathematics scores of students whose teachers are not satisfied with their jobs. The pink lines indicate the mathematics score of students whose teachers are satisfied with their jobs. The direction of the arrows indicates if the score differences between students taught by teachers who are and are not satisfied with their jobs are statistically significant. The upwards pointing arrow indicates that the differences are positive and statistically significant. The downward pointing arrow indicates that the differences are negative and statistically significant. The horizontal line indicates that the differences are not statistically significant.



Nota: Differences in scores for Colombia and Ecuador were not reported, as less than 5% of their students are taught by teachers who are not satisfied with their jobs.



7. Are teachers satisfied with their salaries?

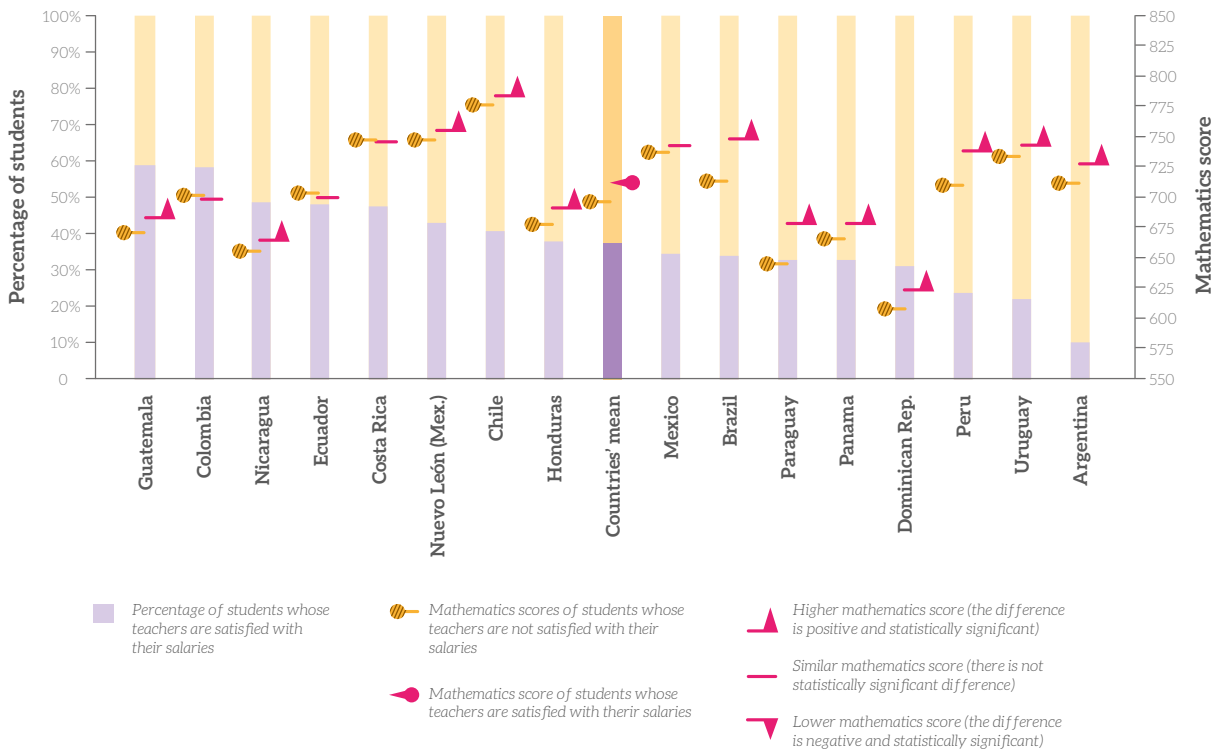
- Salary improvement is one of the main demands of teachers in Latin America and the Caribbean. Teacher salaries affect the social status of the profession and its capacity to attract best candidates to become teachers. It also affects teachers' motivation for career development, continuous training and not leave the profession. For these reasons, salaries can have an important effect on student mathematics achievement levels and the quality of education.
- Third grade teachers were asked to indicate their levels of agreement with the statement "I am satisfied with my salary". Teachers who replied "agree" or "strongly agree" were considered teachers that were satisfied with their salaries, while those who replied "I strongly disagree" or "I disagree" were considered teachers that are not satisfied with their salaries.
- Results showed that most teachers are not satisfied with their salaries. When considering the 15 countries included in the study, only 37% of the students are taught by a teacher that is satisfied with his salary. This percentage varies from 59% in Guatemala to only 10% in Argentina.
- In 12 of the education systems (Argentina, Brazil, Chile, Dominican Republic, Guatemala, Honduras, Nicaragua, Panama, Paraguay, Peru, Uruguay and the Mexican state of Nuevo León) there are statistically significant differences in the mathematics scores that favour students whose teachers are satisfied with their salaries, in comparison with students taught by teachers who are not satisfied with their salary.
- In three of these countries (Brazil, Peru and Uruguay) teachers that are satisfied with their salaries tend to teach students from more socio-economically advantaged context (who tend to obtain higher scores), which in part affects the magnitude of the differences in scores between both student groups.
- On the other hand, attention is drawn to the three countries with lower levels of satisfaction (Argentina, Peru, and Uruguay) that nevertheless obtain relatively high average scores in mathematics, when compared to the rest of the education systems.



GRAPH 7

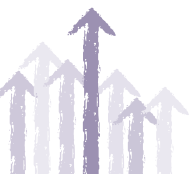
Are teachers satisfied with their salaries?

The purple bars indicate the percentage of students whose teachers are satisfied with their salary. The lines with the yellow circle indicate the mathematics scores of students whose teachers are dissatisfied with their salaries. The pink lines indicate the mathematics test score of students whose teachers are satisfied with their salaries. The direction of the arrows indicates if the score differences in students taught by teachers who are or are not satisfied with their salaries are statistically significant. The upward pointing arrow indicates that the differences are positive and statistically significant. The downward pointing arrow indicates that the differences are negative and statistically significant. The horizontal line indicates that the differences are not statistically significant.



8. What are teacher expectations regarding the education level their students will reach?

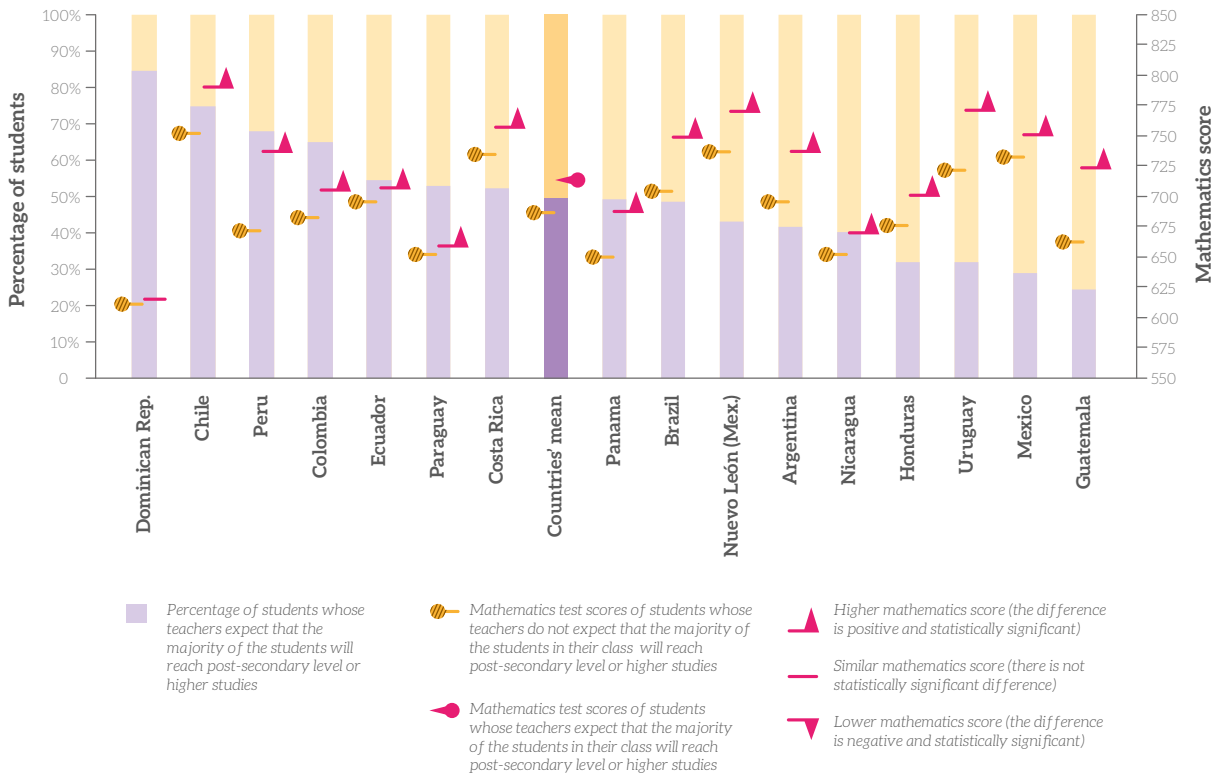
- In order to improve education quality it is important that students feel that they can make progress, and that social conditions are not a barrier for this progress. When teachers expect their students to reach post-secondary or higher studies (e.g. university, technical or professional training institute), it is more probable that students make an effort to fulfil these expectations and that this is reflected in higher achievement levels.
- In order to know more about teachers' expectations for their third grade students, they were asked which would be the highest level of education most of the students in their class will reach: (a) less than lower secondary education; (b) lower secondary education; (c) higher secondary education; (d) non tertiary education.
- When looking within the 15 countries surveyed, only half (50%) of the students are taught by teachers who expect that the majority of their students will reach post-secondary education or more. The percentage varies from 85% in Dominican Republic to 24% in Guatemala. In eight countries (Argentina, Brazil, Guatemala, Honduras, Mexico, Nicaragua, Panama and Uruguay) and in the Mexican state of Nueva León, the percentage of students whose teachers expect will reach a post secondary or higher level of studies is under 50%
- When looking at the education systems, we find that in almost all those cases in which teachers expect the majority of their students to reach post-secondary or higher levels of study, these students obtain significantly higher mathematics test scores than those whose teachers do not expect this. The exception is Dominican Republic, where there are no statistically significant differences between both student groups.
- The positive relationship between teacher expectations and the mathematics test scores of the students are partly influenced by the socio-economic status of the students. As the socio-economic status of students rises, so do teacher expectations that their students will reach post secondary or higher level studies, with the exception of Chile and the Dominican Republic.



GRAPH 8

What are teacher expectations regarding the education level their students will reach?

The purple bars indicate the percentage of third grade students whose teachers expect that most of the students in their class will reach a post-secondary or higher education level. The lines with the yellow circle indicate the mathematics test scores of students whose teachers don't expect the majority of their class to reach post secondary or higher level studies. The lines with the pink arrows indicate the mathematics test score of those students whose teachers do expect to follow post secondary or higher level courses. The direction of the arrows indicates if the score differences in students whose teachers expect the majority of their students in the class to reach post-secondary or higher studies, versus those who will not are statistically significant. The upward pointing arrow indicates that the differences are positive and statistically significant. The downward pointing arrow indicates that the differences are negative and statistically significant. The horizontal line indicates that the differences are not statistically significant.



9. What is the performance level of students from the same classroom?

- A key element in the improvement of quality and equity in education is to be aware of the different levels of performance of those students taught by a same teacher in a same classroom. This information is necessary so that teachers can adapt their teaching practices to the different learning needs of each and every one of their students, responding to the objectives of equity and inclusion in education.
- The percentage of students per performance level in each of the classrooms assessed was calculated in order to find out performance variations in third grade students taught by a same teacher in a same classroom:
 - ➔ Performance level I: Corresponds to students that can order numbers, identify basic geometric shapes, identify missing elements in simple sequences, and read explicit data in tables and graphs.
 - ➔ Performance level II: Corresponds to students that can read and write natural numbers, interpret simple fractions, identify units of measurement, identify relative positions of objects on maps, identify elements in geometric figures or flat representations of geometric shapes, and extract information from tables and graphs.
 - ➔ Performance level III: Corresponds to students that can identify more complex sequences; solve problems with natural numbers, fractions and geometric figures; compare and estimate measurements; interpret information from tables and graphs.
 - ➔ Performance level IV: Corresponds to students that can solve more complex problems with natural numbers and geometric figures, and can solve problems involving comparison and conversion of measurements.
- Results show that in the 15 countries surveyed there are huge differences in performance among students taught by a same teacher in a same classroom. In a typical classroom, almost half of the students (48%) are at Level I, 24% at Level II, 20% at Level III, and 8% at Level IV.
- When comparing education systems, it is observed that approximately half of the students in a classroom are in the higher levels of performance (levels II and IV) in Chile (54%), Uruguay (49%) and the Mexican state of Nuevo León. In contrast, practically all the students are in the lower levels of performance (levels I and II) in Dominican Republic (91%) and Guatemala (88%).

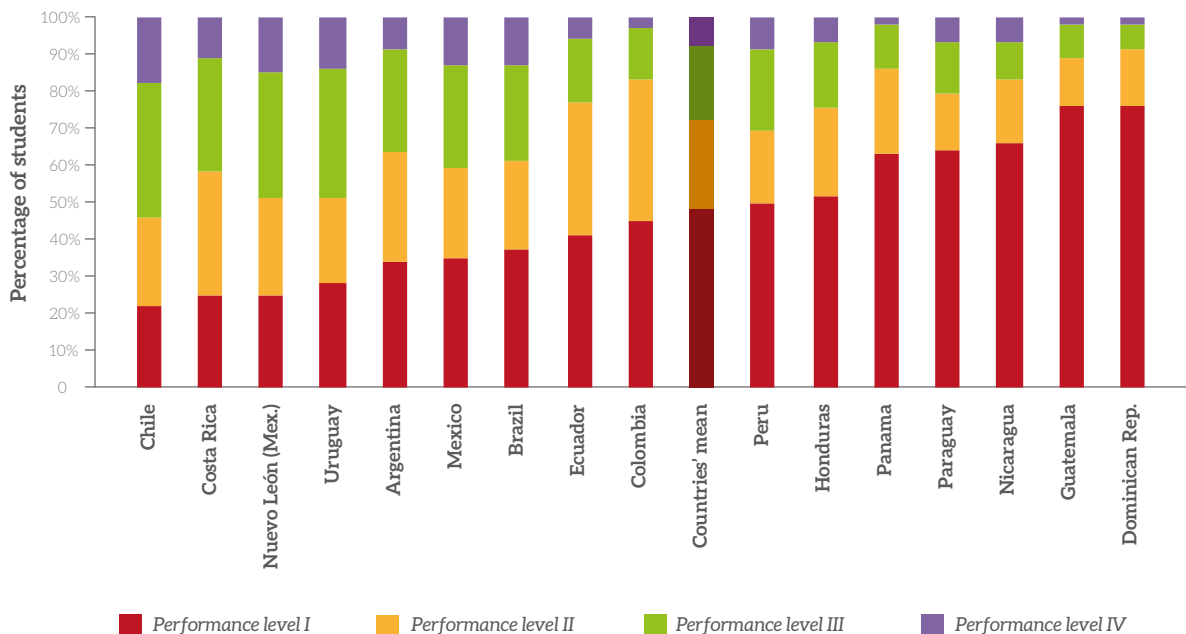


- Additional analyses (not shown on the graph) indicate that score differences in the classroom represent 63% of the total score differences in the mathematics test. A typical classroom has 228 points of difference (equivalent to 2.28 standard deviations) between students with the highest and lowest scores in the mathematics test. This means that the score range in a classroom covers almost the entire range of national score distribution. In fact, the large majority of students (79%) attend classes with students that are at three of more different performance levels.
- These results pose a huge challenge for teachers, who must simultaneously teach students in levels I, II, III and IV, that is, students that have extremely dissimilar mathematical competences. They also pose a huge challenge to teacher training institutions that must instruct teachers that can manage appropriate active pedagogies both in terms of the content they are teaching, and of the different competences and achievement levels of their students. It is necessary to teach this diversity of students in order to improve quality and equity in education.

GRAPH 9

What is the performance level of students from the same classroom?

The graph shows student distribution according to performance levels in a typical third grade classroom. In all the education systems surveyed, it is seen that in a typical classroom students have very different levels of performance. While some are just beginning to learn basic notions of mathematics (Level I), others manage far more advanced mathematical competences (Level IV). This poses a huge challenge for teachers who must instruct students who are in very different stages of their learning.



10. What do teachers think about student assessment in the classroom?

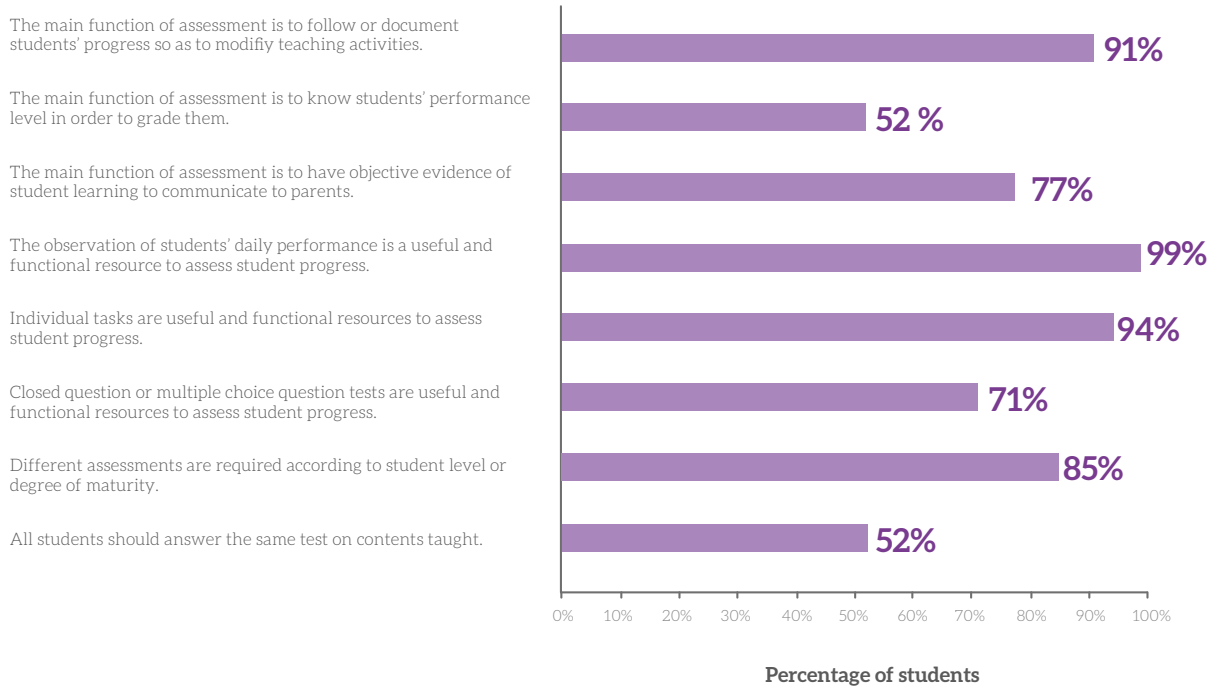
- Classroom assessment of students is a key element to improve education quality. Assessment is at the core of daily teacher routines. An assessment that gives effective information of teaching-learning processes can make substantial contributions to the improvement of students' academic performance.
- In order to know about what third grade teachers think about student assessment in the classroom, they were asked if they "strongly agreed", "agreed", "strongly disagreed" or "disagreed" with eight statements on assessment. Teachers had to reply to each statement independently.
- There are different views of the main function of assessment: (a) follow or record student progress to modify teaching activities; (b) know student performance levels so as to grade them; or (c) have objective evidence of activities to communicate to parents. The first assessment function presents the highest levels of agreement. Practically all the students (91%) of the 15 countries surveyed are taught by teachers who agree or strongly agree that the main function of assessment is to inform teachers so that they can make adjustments to their teaching. This pedagogical function of assessment represents the core of formative assessment or assessment for learning, where teachers must adjust their pedagogy in order to encourage their student learning.
- Regarding classroom assessment resources like daily observation of student performance, individual tasks, and closed or multiple choice questions, these are all considered useful and functional student assessment resources. In the 15 countries surveyed, more than 71% of students are taught by teachers who strongly agree with these statements.
- Finally, teachers' position regarding the need to adapt assessment to the different achievement levels is not all that clear. While 85% of the students are taught by teachers that agree that different students should be given tests according to their level or degree or maturity, 52% is taught by teachers that believe that all students should answer a same exam on class contents taught.



GRAPH 10

What do teachers think about student assessment in the classroom?

The violet bars indicate the average percentage of third grade students of the 15 countries whose teachers “agree” or “strongly agree” with different statements on student assessment in the classroom (excluding the Mexican state of Nuevo León).

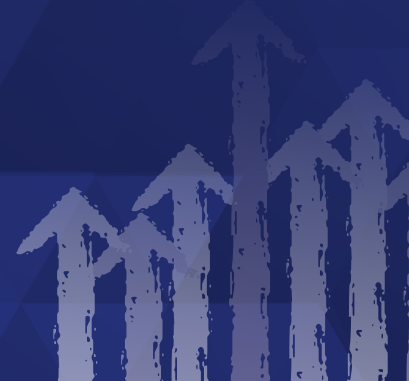






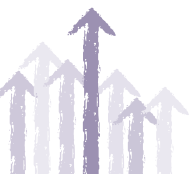
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Sixth grade results



1. What is the initial training of teachers?

- Quality education requires teachers with solid initial training. In Latin American and the Caribbean there are different views of the type of institution that should train teachers (normal school, professional training institute, or university). But, there would seem to be a consensus in the sense that a teaching career requires a teaching degree obtained from a post-secondary level study programme.
- The initial training level of sixth grade teachers was established by asking them which was the highest level of education completed (lower secondary, higher secondary, non-tertiary post-secondary or short term tertiary, tertiary, master's degree or doctorate), and if they held a teaching degree.
- Sixth grade results showed that the percentage of students taught by teachers that hold a post secondary or higher level teaching degree fluctuates between 99% in Uruguay and 40% in Guatemala. In five countries (Colombia, Ecuador, Guatemala, Honduras and Nicaragua) this percentage is lower than 80% These countries pose the greatest challenges in terms of initial teacher training.
- Within each education system, it is seen that the score differences in favour of students taught by teachers with a post-secondary or higher level degree are statistically significant in four countries (Brazil, Ecuador, Nicaragua and Peru). In three countries (Colombia, Guatemala and Mexico) there are no statistically significant differences, and in four education systems (Dominican Republic, Honduras, Panama and the Mexican state of Nuevo León), students taught by teachers who do not hold a post secondary or higher level degree obtain better results in mathematics.
- It is quite probable that the lack of relationship between holding a post secondary or higher level degree and student learning level is a result of the low quality of initial teacher training in the region. These results also suggest that students' performance in mathematics is influenced by factors that are not directly related to the initial training of their teachers.



GRAPH 11

What is the initial training of teachers?

The purple bars indicate the percentage of sixth grade students taught by teachers that hold a post secondary or higher level teaching degree. The lines with the yellow circle indicate the mathematics test scores of students taught by teachers who do not hold a post secondary or higher level teaching degree. The pink lines indicate the mathematics test scores for students taught by teachers holding a post-secondary or higher level teaching degree. The direction of the arrows indicates if the score differences between students whose teachers hold or hold not a post-secondary degree (or higher) are statistically significant. The direction of the arrows indicates if the score differences between students whose teachers are or are not post secondary or higher level teaching degree holders are statistically significant. The upward pointing arrow indicates that the differences are positive and statistically significant. The downward pointing arrow indicates that the differences are negative and statistically significant. The horizontal line indicates that the differences are not statistically significant.



Note: Differences of Chile, Costa Rica, Paraguay and Uruguay were not reported, as less than 5% of their students are taught by teachers who do not hold post-secondary or higher teaching degrees.

(*) Countries with more than 20% cases with no information (non responses or missing data).



2. Do teachers have opportunities for professional development?

- Quality education requires teachers that can regularly update their knowledge and teaching practices. Teacher participation in training activities related to subjects taught is highly valued as a strategy to improve student learning and thus contribute to quality education.
- In order to know what is the sixth grade teachers' participation in training activities, they were asked if they had done a training course (60 or more hours) in mathematics in the past two years.
- The results show that only 34% of the sixth grade students of the 15 countries included in the survey are taught by teachers who have done a mathematics teacher training course in the past two years. This percentage varies from 58% in Peru to 9% in Nicaragua.
- Eight education systems (Brazil, Colombia, Costa Rica, Guatemala, Mexico, Nicaragua, Peru and the Mexican state of Nuevo León) show differences in scores that are statistically significant and in favour of students whose teachers have done training courses in mathematics. In another six countries (Argentina, Ecuador, Honduras, Panama, Paraguay and Uruguay) there are differences that favour students whose teachers do not have training courses. Two countries (Chile and Dominican Republic) show differences in score that are not statistically significant.
- Results among countries are dissimilar and findings show no uniform trends. The lack of a positive relationship between training in mathematics and student performance in the subject could be explained by the low quality and relevance of the training received.



GRAPH 12

Do teachers have opportunities for professional development?

The purple bars indicate the percentage of sixth grade students taught by teachers who have done a mathematics training course (60 or more hours) in the past two years. The lines with yellow circles indicate the score obtained in the mathematics test by students taught by teachers who have not done a mathematics training course in the last two years. The pink lines indicate the score obtained in the mathematics test by students whose teachers hold a training course in mathematics done in the past two years. The direction of the arrows indicates if the score differences between students whose teachers have or have not done a training course in mathematics in the last two years are statistically significant. The upward pointing arrow indicates that the differences are positive and statistically significant. The downward pointing arrow indicates negative and non statistically significant differences. The horizontal line indicates that there are not statistically significant differences.



Note: (*) Country with more than 20% cases with no information (non responses or missing data).



3. Do teachers receive pedagogical support from their school leaders?

- Effective schools have leaders teams that exercise strong pedagogical leadership over their teachers, supporting them in the implementation of their teaching practices. This support is fundamental to guide teachers' work, to improve teaching-learning processes, and to contribute to quality education.
- In order to find out the degree of teaching support received by sixth grade teachers, they were asked how frequently the school leaders: (a) visits our classrooms and carries out classroom observations; (b) gives us feedback on our teaching; (c) gives us feedback on our student assessment; (d) gives us feedback on our lesson plans; (e) gives us feedback on our classroom management. Teachers who replied "once in the semester", "more than once in the semester", or "once a month" to all of these were considered to be teachers who receive pedagogical support from the school leaders. Teachers who responded "never" to one or more statements were considered of the questions were considered teachers that received no pedagogical support from their school leaders.
- The large majority (74%) of sixth grade students from the 15 countries studied are taught by teachers that receive support from their school leaders. In Dominican Republic, the percentage is 94%. Colombia is the only country where less than half (44%) of the students are taught by teachers who receive pedagogical support from the school leaders.
- Results show that within the countries there is no clear relationship between pedagogical support and student performance. In five education systems (Dominican Republic, Honduras, Nicaragua, Panama and Peru) there are few score differences that are positive significant score differences in favour of students whose teachers receive pedagogical support. But, there are four countries (Costa Rica, Colombia, Mexico and Paraguay) where score differences favour students whose teachers do not receive this support. Finally, seven education systems (Argentina, Brazil, Chile, Ecuador, Guatemala, Uruguay and the Mexican state of Nuevo León) there are not differences in score estatistically significant.
- The absence of a positive relationship between receiving pedagogical support from the school leaders and student performance can be attributed to different reasons. One of these is that teachers with greater teaching weaknesses (and who therefore teach students with lower levels of performance) receive pedagogical support. Another possible reason refers to the limitations of a teacher questionnaire with fixed reply options. Although teachers can report if they receive different types of pedagogical support, the teacher questionnarie does not capture the quality and efficiency of the support received.

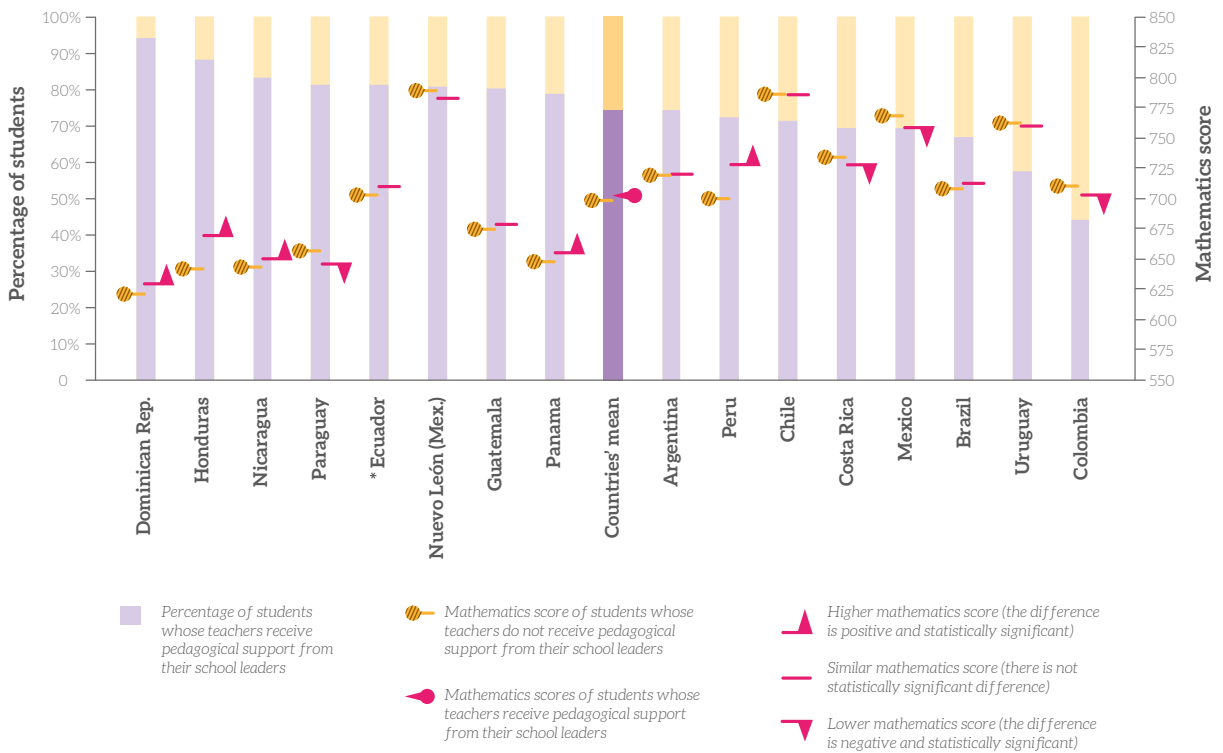


GRAPH 13

Do teachers receive pedagogical support from the school leaders?

The purple bars indicate the percentage of sixth year students whose teachers receive pedagogical support from the school leaders. The lines with the yellow circle indicate the mathematics test scores of students whose teachers do not receive pedagogical support from their school leaders. The pink lines indicate the mathematics test scores of students whose teachers receive pedagogical support from their school leaders.

The direction of the arrows indicates if the score differences between students whose teachers receive and don't receive pedagogical support from their school leaders are statistically significant. The upward pointing arrow indicates that the differences are positive and statistically significant. The downward pointing arrow indicates that the differences are negative and statistically significant. The horizontal line indicates that the differences are not statistically significant.



Note: (*) country with more than 20% cases with no information (non responses or missing data).



4. Is there a classroom environment that supports learning?

- For students to learn in the classroom it is essential that teachers work in a classroom environment that favours learning. In other words, in an environment with friendly and respectful relationships and collaboration between teacher and students.
- To know if sixth grade teachers work in a classroom environment that favours learning, they were asked how much they agreed with the following statements: a) I can teach without being interrupted; (b) students pay attention to my explanations; (c) I enjoy teaching this class; (d) students are aggressive among themselves (inverse coding³); (e) students tend to help slow learner students; (f) students show respect for their classmates. Teachers who responded “I agree” or “I strongly agree” to all statements were considered to be teachers who worked in a classroom climate that favours learning. Teachers who answered “I strongly disagree” or “I disagree” to one or more statements were considered to be teachers who worked in a classroom environment that does not favour learning.
- The results of the 15 countries studied show that 56% of sixth grade students attend classrooms with an environment that favours learning. These percentages vary from 73% in Paraguay to 29% in Brazil. In five education systems (Argentina, Brazil, Colombia, Costa Rica and Uruguay) less than half the students are taught by teachers who work in a classroom climate that favours learning.
- Almost all the education systems (Argentina, Brazil, Chile, Costa Rica, Dominican Republic, Ecuador, Peru, Uruguay and the Mexican state of Nuevo León) have score differences that are statistically significant in favour of students who study in a classroom with an environment that favours learning, compared with students who study in a classroom with no such environment. No statistically significant differences are observed in the other countries (Colombia, Guatemala, Honduras, Mexico, Panama and Paraguay) or the differences favour students who attend schools with a negative classroom environment (Nicaragua).
- In Ecuador and Peru, the positive relation between classroom environment and student learning is partly mediated by the socio-economic status of the students. In both cases, the classrooms with best learning environment are also those attended by students of a higher socio-economic status. This contributes to increase the score differences between students of different socio-economic

³ Only in this statement, the “I strongly agree” answers were treated as “I strongly disagree” replies, the “I agree” answers as “I disagree”, the “I disagree” answers as “I agree”, and the “I strongly disagree” answers as “I strongly agree”.

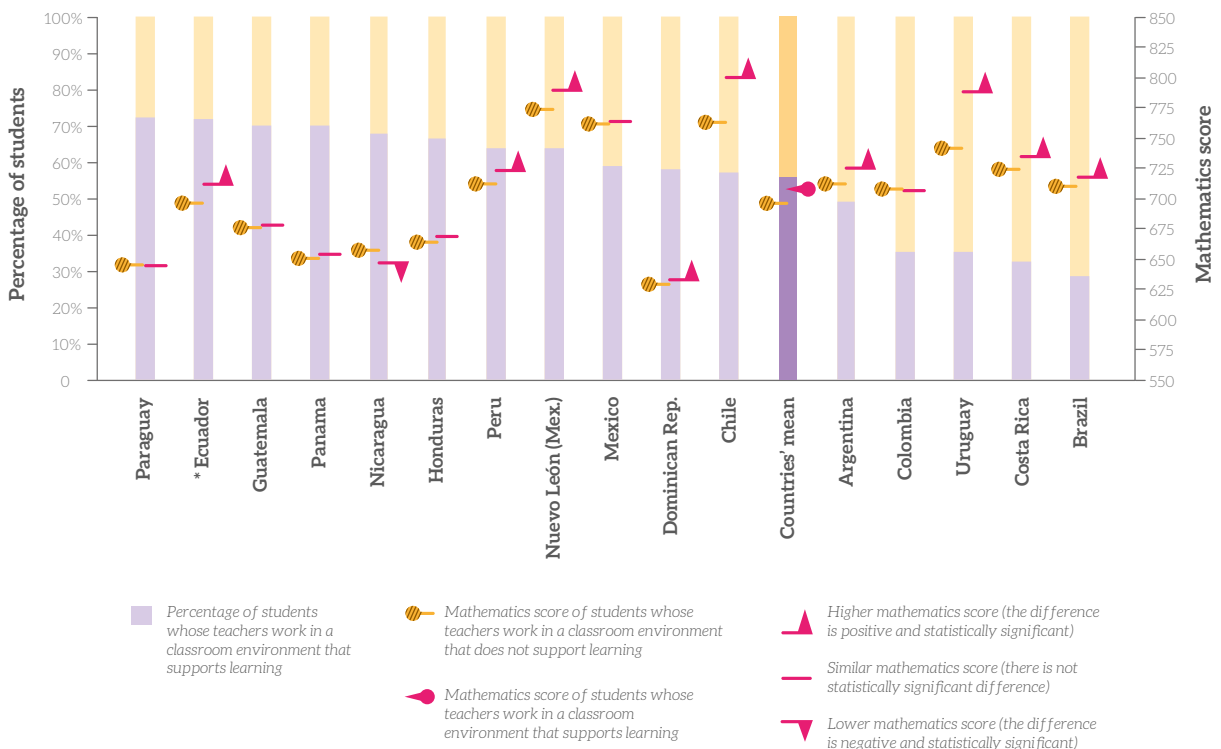


status. The fact that students with a lower socio-economic status attend classes where it is less likely to find a classroom environment that favours learning poses a challenge of equity for these countries.

GRAPH 14

Is there a classroom environment that supports learning?

The purple bars indicate the percentage of sixth grade students whose teachers work in classroom environment that supports learning. The lines with the yellow circle indicate the mathematics test score of students whose teachers work in a classroom environment that does not support learning. The lines with the pink arrows indicate the mathematics test scores of students whose teachers work a classroom environment that supports learning. The direction of the arrows indicates if the score differences between students whose teachers work or do not work in a classroom environment that supports learning are statistically significant. The upward pointing arrow indicates that the differences are positive and statistically significant. The downward pointing arrow indicates that the differences are negative and statistically significant. The horizontal line indicates that the differences are not statistically significant.

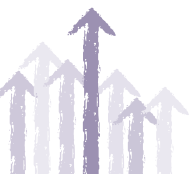


Note: (*) Country with more than 20% cases with no information (non responses or missing data).



5. Is there violence in schools?

- Violence in schools is a problem that causes increasing concern in the region. School violence attempts against the physical and psychological wellbeing of the students and has a negative impact on their achievement levels.
- In order to learn about the levels of violence in schools, sixth grade teachers were asked if some of the following occurred in their schools during the past month: (a) a student insulted or threatened a classmate; (b) a student hit or harmed a classmate; (c) a student was left out of classmates' games or activities; (d) a student insulted or threatened a teacher. The reply options ranged from: "no, it didn't happen" (1 point), "it happened sometimes" (2 points), and "it happened often" (3 points). School violence was considered when teacher replies averaged 2 or more points. With opposite results, no school violence was considered.
- In the 15 countries surveyed, the percentage of students that attend schools with episodes of violence vary from 1% in Ecuador to 31% in Uruguay. In seven countries (Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic and Uruguay), 20% or more of the students attend schools with episodes of violence.
- Six of the education systems showed statistically significant mathematics score differences in favour of students who attend schools with no episodes of violence, in comparison with students who attend schools with episodes of violence. This is the case of Argentina, Chile, Costa Rica, Dominican Republic, Uruguay and the Mexican state of Nuevo León. In the rest of the countries (Guatemala, Mexico, Nicaragua and Paraguay), there are no are not differences in score estatistically significant, or these differences favour students who attend schools with episodes of violence (Brazil and Colombia).
- In Brazil, the fact that students that attend schools with episodes of violence obtain better results than those who attend schools with no episodes of violence can be understood considering the socio-economic status of the students. Teachers who report higher levels of violence in schools that serve students of higher socio-economic status, which are the students that tend to have a better acedemic performance.
- When comparing violence levels in different countries, we should also ask whether these are caused by real variations in the levels of violence existing in schools or to differences in the concepts of violence in different countries (what is considered violent in one country is not in



another). Another possible explanation of these results is that it may be difficult for a teacher to know about violence among students within the school but outside the classroom, which might lead to an underrepresentation of these situations in some countries.

GRAPH 15

Is there violence in schools?

The purple bars indicate the percentage of sixth grade students that attend schools in which there was an episode of violence in the past month. The lines with the yellow circle indicate the mathematics score of students who attend school in which there were no episodes of violence. The pink lines indicate the mathematics score of students who attend schools with no episodes of violence. The direction of the arrows indicates if the score differences between students who attend schools with or without episodes of violence are statistically significant. The upward pointing arrow indicates that the differences are positive and statistically significant. The downward pointing arrow indicates that the differences are negative and statistically significant. The horizontal line indicates that the differences are not statistically significant.



Note: In the case of Ecuador, Honduras, Panama and Peru score differences were not reported, as less than 5% of their students attend schools in which there were episodes of violence in the past month.

(*) Country with more than 20% of cases without information (non responses or missing data).



6. Are teachers satisfied with their job?

- Teachers' satisfaction with their job is important to motivate excellent teaching performance and retain the best in the profession. At the same time, this makes it more probable that these teachers' students will benefit from better learning opportunities in the classroom, which contribute to improve education quality.
- In order to learn if sixth grade teachers are satisfied with their work, they were asked to indicate their degree of agreement with the following statements: (a) I like working in the school; (b) my work is considered valuable in this school; (c) my work makes me extremely frustrated (inverse coding⁴); (d) I feel satisfied with my work as a teacher. Teachers who replied "I agree" or "I strongly agree" to all statements were considered teachers that are satisfied with their work. Teachers who replied "I strongly disagree" or "I disagree" to one or more statements were considered teachers that are not satisfied with their jobs.
- 87% of sixth grade students in the 15 countries surveyed are taught by teachers who are satisfied with their jobs. Percentages vary from 93% in Panama to 69% in Brazil.
- Half of the education systems have differences in score estatistically significant in favour of students taught by teachers that are satisfied with their jobs, compared with students taught by teachers that are not satisfied with their jobs. These education systems are Argentina, Chile, Ecuador, Mexico, Nicaragua, Peru, Uruguay and the Mexican state of Nuevo León. In five countries (Brazil, Costa Rica, Dominican Republic, Guatemala and Honduras) there are no satistically significant score differences, and in the rest of the countries (Colombia, Panama and Paraguay) the differences favour students taught by teachers who are not satisfied with their jobs.
- The fact that teachers from Latin America and the Caribbean are satisfied with their jobs is good news. However, results show that these high levels of satisfaction do not necessarily translate into high levels of student achievement. There are different possible explanations for the lack of a positive relation between teacher job satisfaction anf student learning. One is that teacher job satisfaction is a necessary but not sufficient condition for improving teaching-learning processes. Teacher job satisfaction does not replace deficiencies in their pedagogical

⁴ Only in this statement, the "I strongly agree" answers were treated as "I strongly disagree" replies, the "I agree" answers as "I disagree", the "I disagree" answers as "I agree", and the "I strongly disagree" answers as "I really agree".



practices. Another possible explanation is that, given that most teachers are satisfied with their jobs, there is not sufficient variability in the data to explain the difference in the mathematics scores of their students.

GRAPH 16

Are teachers satisfied with their job?

The purple bars indicate the percentage of sixth grade students taught by teachers that are satisfied with their jobs. The lines with the yellow circle indicate the mathematics test score of students whose teachers are not satisfied with their jobs. The pink lines indicate the mathematic test scores of students whose teachers are satisfied with their jobs. The direction of the arrows indicates if the score differences between students taught by teachers that are satisfied with their jobs are or are not statistically significant. The upward pointing arrow indicates that the differences are positive and statistically significant. The downward pointing arrow indicates that the differences are negative and statistically significant. The horizontal line indicates that the differences are not statistically significant.



Note: (*) Country with more than 20% of cases without information (non responses or missing data).



7. Are teachers satisfied with their salaries?

- Salary improvement is one of the main demands of teachers in Latin America and the Caribbean. Teacher salaries affect the social status of the profession and its capacity to attract the best possible candidates to become teachers. It also affects teachers' motivation for career development, continuous training and not leaving the profession. For these reasons, salaries can have an important effect on student mathematics achievement levels and educational quality.
- Sixth grade teachers were asked to indicate their levels of agreement with the statement "I am satisfied with my salary". Teachers who replied "agree" or "strongly agree" were considered teachers that were satisfied with their salaries, while those who replied "I strongly disagree" or "I disagree" were considered teachers that are not satisfied with their salaries.
- Results showed that most teachers are not satisfied with their salaries. While in Guatemala, 63% of students are taught by teachers who are satisfied with their salaries, in Uruguay this figure is reduced to 7% of the students.
- In most of the countries studied there is a positive relationship between teacher satisfaction with their salaries and their student learning achievements. In nine of these countries (Brazil, Chile, Ecuador, Guatemala, Nicaragua, Panama, Paraguay, Peru and Uruguay) students taught by teachers that are satisfied with their salaries obtain significantly higher scores in mathematics than students whose teachers are not satisfied with their salaries. Nonetheless, in another seven countries (Argentina, Colombia, Dominican Republic, Honduras, Costa Rica, Mexico and the Mexican state of Nuevo León) the differences are not statistically significant.
- The magnitude of the relationship between teachers' satisfaction with their salaries and students' achievement in mathematics is partly mediated by the socio-economic status of the students. In Brazil, Ecuador, Guatemala and Uruguay teachers who are satisfied with their salaries tend to teach students from more socio-economically advanced context (who tend to get higher scores). In Argentina, the lack of a relationship between these variables might be due to the fact that teachers that are more satisfied with their salaries tend to teach students of a lower socio-economic status.



GRAPH 17

Are teachers satisfied with their salaries?

The purple bars indicate the percentage of sixth grade students whose teachers are satisfied with their salaries. The lines with the yellow circle indicate the mathematics test scores of the students whose teachers are not satisfied with their salaries. The pink lines indicate the mathematics scores obtained by students whose teachers are satisfied with their salaries. The direction of the arrows indicates if the score differences between students taught by teachers who are or are not satisfied with their salaries are statistically significant. The upward pointing arrow indicates that the differences are positive and statistically significant. The downward pointing arrow indicates that the differences are negative and statistically significant. The horizontal line indicates that the differences are not statistically significant.



Note: (*) Country with more than 20% cases with no information (non responses or missing data).



8. What are teacher expectations regarding the education level their students will reach?

- In order to improve education quality it is important that students feel that they can make progress, and that social conditions are not a barrier for this progress. When teachers expect their students to reach post-secondary or higher studies (e. university, technical or professional training institute), it is more probable that students make an effort to fulfil these expectations and that this is reflected in higher achievement levels.
- In order to know more about teachers' expectations for their third grade students, they were asked which would be the highest level of education most of the students in their class will reach: (a) less than lower secondary education; (b) lower secondary education; (c) higher secondary education; (d) non tertiary education.
- When considering the 15 countries studied, only 52% of sixth grade students is taught by teachers who expect that the majority of their students will reach post-secondary education or more. This percentage is higher than 75% in three countries (Chile, Colombia and Peru), and less than a third of the students are taught by teachers that have these expectations in another two countries (Guatemala and Honduras).
- When looking within the education systems, we find that 15 of the 16 cases studied present statistically significant mathematics scores in favour of students whose teachers have higher expectations regarding the education level to be reached by their students. The only country that does not present statistically significant differences is Dominican Republic.
- The positive relationship between teacher expectations and the mathematics test scores of the students are partly influenced by the socio-economic status of the students. As the socio-economic status of students rises, so teacher expectations that their students will reach post secondary or higher level studies. This is the case in all the education systems surveyed, with the exception of Dominican Republic.



GRAPH 18

What are teacher expectations regarding the education level their students will reach?

The violet bars indicate the percentage of six grade students whose teachers expect that most of the students in their class will reach a post-secondary or higher education level. The lines with the yellow circle indicate the mathematics test score of students whose teachers do not expect the majority of their students to reach post-secondary or higher level studies. The pink lines indicate the mathematics test scores obtained by students whose teachers expect the majority of their students to reach post-secondary or higher level studies. The direction of the arrow indicates if the score differences between students whose teachers expect the majority of their students to reach post-secondary or higher studies or not are statistically significant. The upward pointing arrow indicates that the differences are positive and statistically significant. The downward pointing arrow indicates that the differences are negative and statistically significant. The horizontal line indicates that the differences are not statistically significant.

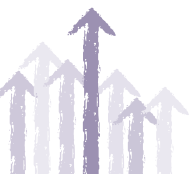


Note: (*) Country with more than 20% cases with no information (non responses or missing data).



9. How do students perform in a same classroom?

- A key element in the improvement of quality and equity in education is to be aware of the different performance level of those students taught by a same teacher in a same classroom. This information is necessary so that teachers can adapt their teaching practices to the different learning needs of each and every one of their students, responding to the objectives of equity and inclusion in education.
- The percentage of students per performance level in each of the classrooms assessed was calculated in order to find out performance variations in sixth grade students taught by a same teacher in a same classroom:
 - ➔ Performance level I: Corresponds to students who can estimate the weights (mass) and length of objects; identify relative positions on maps; identify rules or patterns in the formation of simple number sequences and continuing them; order natural numbers and decimals; use the structure of the decimal system and monetary systems; and solve simple problems that involve proportional variables.
 - ➔ Performance level II: Corresponds to students who can solve simple problems that involve natural numbers, decimal numbers and fractions, and proportional variations; relate different spatial views; determine missing terms or continuing graphic or numerical sequences; identify acute, right and obtuse angles, and solve simple problems that involve angles; determine measures of length or the mass of objects by through graduated instruments; and calculate perimeters and areas of polygons.
 - ➔ Performance level III: Corresponds to students that can solve problems of proportional variations that require interpretation of the provided information; convert units of measurement and solve problems that involve measurements; solve problems that involve angles and identify relations of perpendicularity and parallelism on a plane; interpret formation patterns of numerical sequences; solve problems that involve the calculation of perimeters and areas in polygons; and solve problems that require reading and interpretation of tables and graphs.
 - ➔ Performance level IV: Corresponds to students that can solve more complex problems that involve operations of natural numbers, decimal numbers and fractions, or proportional variations; calculate polygon areas, perimeters or angles; convert units of measurement and solve problems that require the interpretation of data presented in more complex tables and graphs



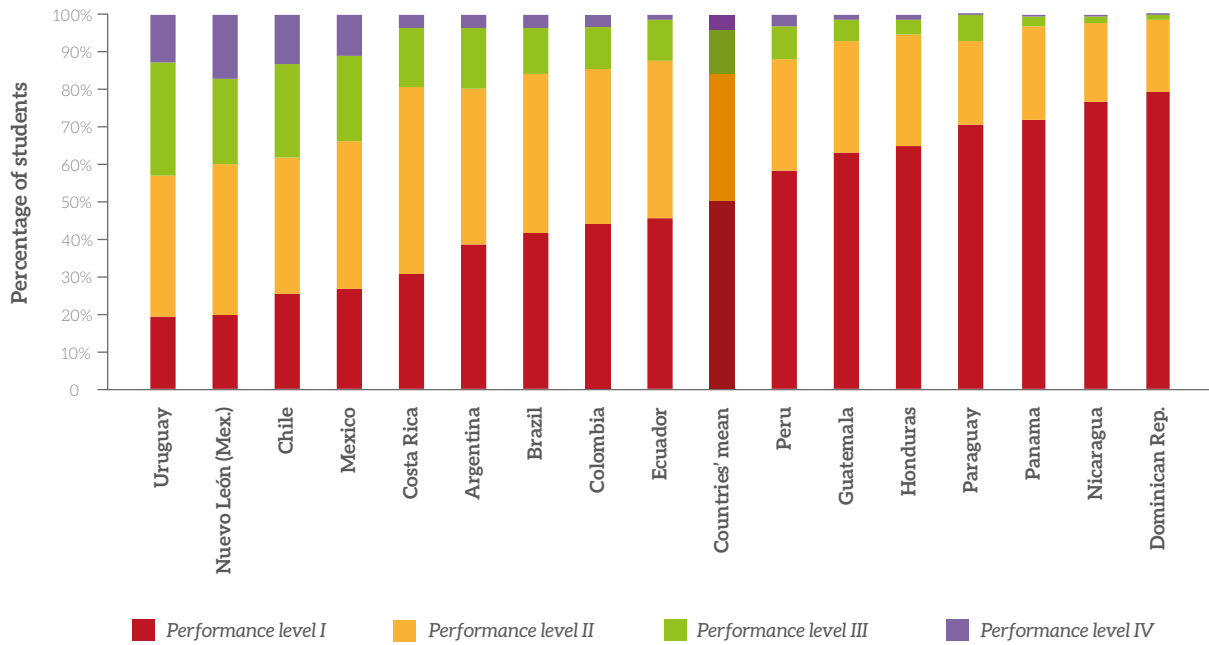
- The results indicate that in the 16 education systems that took part in the study, there are great differences in the achievement of sixth grade students taught by a same teacher in a same classroom. In a typical classroom, half the students (50%) are in Level I, 34% in Level II, 12% in Level III, and 4% in Level IV.
- When comparing the education systems, there are huge differences in the distribution of student achievement in a classroom. Uruguay is the country with the largest percentage (43%) of students in the highest levels (level III and IV) (43%), followed by the Mexican state of Nuevo León (40%) and Chile (38%). This situation contrasts with countries in which the percentage of students in the higher performance levels is minimum: Dominican Republic (1%), Panama (3%) and Nicaragua (3%).
- Additional analyses (not shown on the graph) indicate that the classroom score differences represent 71% of the total scores of the mathematics test. In a typical classroom there are 234 points of difference (equivalent to 2.34 standard deviations) between students with the highest and lowest scores in the mathematics test. This means that the range of classroom scores covers almost the complete range of national score distributions. In fact, the large majority of the students (69%) attend class with students that are in three or more different performance levels.
- These results pose an enormous challenge to teachers, who must simultaneously teach students that are in Performance levels I, II, III and IV, that is, students that have very dissimilar mathematical competences. They also pose a huge challenge to teacher training institutions, who must train teachers to manage active pedagogies that are appropriate both for what they are teaching, and for the different competences and performance levels of their students. To address this diversity of students is necessary for improving quaity and equity in education.



GRAPH 19

How do students perform in a same classroom?

The graph shows student distribution according to performance levels in a typical sixth grade classroom. In all the education systems studied it has been observed that in a typical classroom, students have very different performance levels. While some are just beginning to learn basic notions of mathematics (Level I), others manage much more advanced mathematical competences (Level IV). This poses an huge challenge for teachers who must teach student that in very different stages of their learning.





10. What do teachers think about student assessment in the classroom?

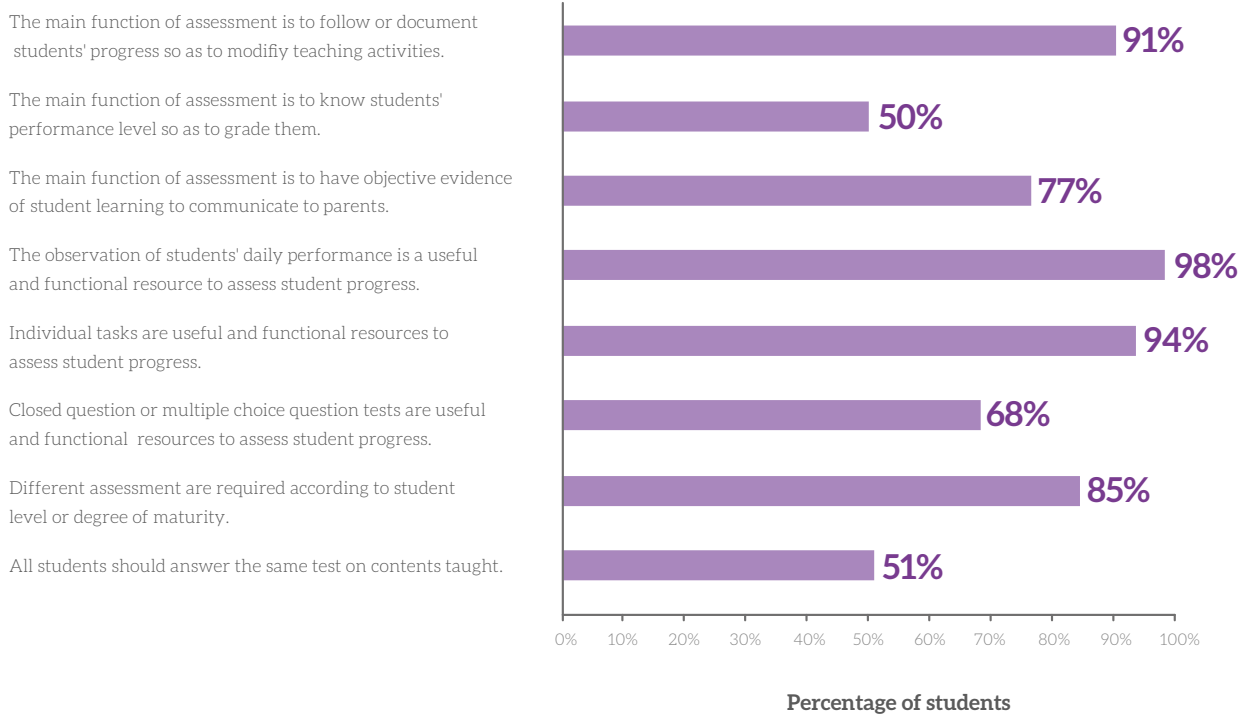
- Student assessment in the classroom is the key element for the to improve education quality. Assessment is at the core of daily teacher routines. An assessment that provides effective information about teaching-learning processes can substantially contribute to improve students' academic performance.
- In order to know about what sixth grade teachers think about student assessment in the classroom, they were asked if they "strongly agreed", "agreed", "strongly disagreed" or "disagreed" with eight statements on assessment. Teachers had to reply to each statement independently.
- There are different views of the main function of assessment: (a) follow or record student progress to modify teaching activities; (b) know student performance levels so as to grade them; or (c) have objective evidence of student achievement to communicate to parents. For sixth grade teachers, the first of these functions presents the highest levels of agreement. Practically all the students (91%) in the 15 countries studied are taught by teachers who agree or strongly agree that the main function of assessment is to follow or document students' progress so as to modify their own teaching practices. This pedagogical function of assessment represents the core of formative assessment or assessment for learning, where teachers must adjust their teaching so as to encourage student achievement.
- Regarding classroom assessment resources, like daily observation of student performance, individual task, and closed or multiple choice questions, these are all considered useful and functional student assessment resources. In the 15 countries surveyed, more than 71% of students are taught by teachers who agree or very strongly agree with these statements.
- Finally, teachers' position regarding the need to adapt assessment to the different levels of student achievement is not all that clear. While 85% of the students are taught by teachers who agree that different students should be given tests according to their level or degree or maturity, 52% is taught by teachers that believe that all students should answer a same exam on class contents taught.



GRAPH 20

What do teachers think of student assessment in the classroom?

The violet bars indicate the percentage of sixth grade students from the 15 countries surveyed (excluding the Mexican state of Nueva León) whose teachers “agree” or “strongly agree” with different statements regarding student assessment in the classroom.







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Conclusions



Conclusions

Improving education quality in Latin America and the Caribbean supposes the existence of well trained, committed teachers, whose professional work is acknowledged. The teachers are the ones who are in daily contact with students in the classroom. This study poses 10 key questions to understand education quality from a teacher's point of view.

The questions address diverse issues like teacher training, their levels of professional satisfaction and teaching conditions in schools. The answers to these questions provide insights regarding the type of reforms required to progress towards a better education for all.

Considering the 16 educational systems studied, the results show that the vast majority of third and sixth grade students have teachers that hold a teaching degree from a post-secondary (or higher) education level. The vast majority also have teachers that receive support from their school leaders. However, only half of the students attend schools with classroom environment that supports learning, in other words, where teachers can perform without interruption and are capable of maintaining the attention of their students, among others.

Third and sixth grade students attend very heterogeneous classrooms in terms of achievement levels. This poses an huge challenge for teachers, who must maintain the attention of students with very different learning needs.

Despite the fact that every classroom has students that reach high levels of achievement, only half the students have teachers who expect their students to follow post-secondary or higher level courses of study. One out of every six students attends schools with episodes of violence. The large majority of the students are taught by teachers who are satisfied with their jobs, but not with their salaries.

When comparing result among different countries, important differences are observed in the characteristics of third and sixth grade teachers. As expected, countries with higher scores in mathematics report a higher percentage of students taught by teachers who hold a teaching degree from a post-secondary (or higher) education level, compared to with the countries with lower scores in mathematics.

Paradoxically, the countries with lower performance levels concentrate the highest proportion of teachers who inform that they are satisfied with their jobs, receive pedagogical support from their school leaders, work in a classroom environment that supports learning, and in schools with lower levels of school violence. This applies both to the third and sixth grade.



The results also show that within the countries, there is a complex relation between the characteristics of third and sixth grade teachers and the performance level of their students. When teachers are satisfied with their salaries, they have high expectations regarding their students, work in schools with no violence and in an environment with friendly and respectful relationships, their students tend to achieve higher performance levels. However, the relationship with other teacher characteristics (like their initial and continuing training) and student learning is not so clear.

It is interesting to compare the results of this study with the type of teacher we would like to have. There is a consensus in terms of the need to have well trained and highly motivated teachers. It would also be expected that these teachers should work in safe schools with an environment that encourages teaching and learning. Finally, these teachers should have high expectations for their students, and have teaching competences that enable all their students to learn, regardless of their initial level.

When comparing the type of existing teacher with the teacher we would like to have, there is a gap which must be closed with effective policies. In what follows, the results of this study are discussed in the light of the current debate of education policies, with a focus on teacher training, pedagogical leadership and teacher classroom practices.

The current debate on teacher training is marked by the professionalization of the teaching career (Louzano and Moriconi, 2014). There is a consensus that, ideally, all teachers should hold a tertiary level teaching degree. The results of this study show that this target has not been reached yet in the region, especially in countries like Guatemala and Nicaragua, where half or less than half of third and sixth grade students are taught by teachers that hold a post-secondary degree (or higher). Nonetheless the trend is that in the medium term, the totality of the teachers in the region will fulfill this requirement (UNESCO-OREALC, 2013).

There are serious deficiencies in initial teacher training in Latin America and the Caribbean. Future teachers tend to train at institutions that present three main shortcomings: (1) excessive emphasis on education theory, in detriment of teaching practice, (2) lack of solid teacher training with an emphasis on how to teach the subject; and (3) professional practices separated from the training process, usually because they lack adequate supervision, are too short, or because they are scheduled at the end of the study programme (UNESCO-OREALC, 2013; Louzano and Moriconi, 2014)

Continuous teacher training is highly valued by teachers in terms of professional advancement. However, further training will only have an impact on learning if it is capable of changing the teaching practices of the teachers. This study shows that approximately one fourth of third grade students and a third of sixth grade students have a teacher who has taken part in a mathematics training course in the last two years. However, it also shows that there is no clear relationship between this kind of training and student achievement.



The current debate on teacher training shows that the most effective training for changing teaching practices is collaborative and contextualized professional learning. This type of training is based on the idea that teachers learn from what they do in their daily classroom work, and therefore prioritize reflection regarding their own pedagogical practices through, for example, classroom observation, lesson study sessions with the collaboration of other teachers, professional networks, internships, learning communities, work groups, mentors, and virtual learning communities, among others (Calvo, 2014; Näslund-Hadley and Bando, 2016). Promoting spaces for pedagogical reflection in schools also has a lower cost than offering a training course.

Effective schools tend to have leaders that exercise strong pedagogical leadership, in other words, where the central focus is student learning (UNICEF, 2004; Leithwood et al, 2006). The results of this study show that three out of four third and sixth grade students have a teacher that admits to receiving pedagogical support from the school leaders. However, it would seem to be necessary to improve the quality and effectiveness of the support received, for example, through monitoring and direct classroom observation, and teachers' reflections on the observed practices.

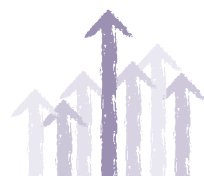
Students learn more when there is an environment with friendly and respectful relationships in the classroom, when teachers are capable of maintaining their students' attention and can teach without being interrupted. Unfortunately, only approximately half of the third and sixth grade students in the 15 countries studied attend classes in which the classroom environment favours learning. These results are consistent with the evidence that shows that teachers in the region have serious classroom management difficulties, which translate into a limited capacity to maintain student attention and make effective use of teaching time (Bruns and Luque, 2014). The improvement of classroom teaching requires that school leaders encourage reflection periods on this issue among their teachers.

In all the countries studied it is seen that a same classroom has students at very different learning stages. This diversity of learning stages poses a challenge for effective classroom management. If teachers are to maintain their students' attention, teachers must have a vast range of pedagogical strategies that enable them to incorporate all their students into the learning process. Effective schools acknowledge and accept the heterogeneity of learning levels and rhythms of their students, implementing pedagogical practices that enable learning for all (UNICEF, 2004). The diversity of learning levels in the classroom poses a challenge for initial teacher training programmes, which must train their teachers to work in extremely heterogeneous classrooms, offering significant learning opportunities to all the students (Bruns and Luque, 2014).



Quality education requires motivated teachers, and a professional career that is able to attract and retain good educators. This study shows high levels of job satisfaction among third and sixth grade teachers, but not with their salaries. This is consistent with the teacher salaries in many countries in the region, which are low and do not correspond to their professional level when compared with other equivalent professions (Bruns and Luque, 2014; Cuenca 2015; Mizala and Ñopo, 2011).

The strengthening of the teaching profession is fundamental for the improvement of education quality, as is the improvement of education practices and of teachers' levels of satisfaction with their profession. This requires a strong political leadership, economic resources, institutional capacity and a culture open to change (Weinstein, 2014). The dream of a quality education in Latin America and the Caribbean can only be fulfilled by attracting and retaining the best into the profession.



Methodology

The analyses presented in this study were based on official TERCE data bases. Student and teacher databases were joined, and include oversampling cases for the countries that worked with national modules. The following variables were used:

- Student mathematics test scores. The standardized IRT score was taken, expressed on a scale with a mean $M = 700$ and standard deviation $SD = 100$
- Variables of the Teacher Questionnaire. Third and sixth grade teachers answered the same questionnaire.
- The school socio-economic status index, corresponds to the mean of the index of students in the school.

TERCE uses representative national (or state) samples of students, whose teachers are also surveyed for context information. However, the teacher sample is not necessarily representative at the national (or state) level. Therefore, results on teacher (or school) levels should be interpreted with this limitation in mind. For this reason, this report provides the percentage of students whose teachers have certain characteristics (and not the percentage of teachers that have certain characteristics).

The following were calculated for each education system:

- Bar graph with the percentage of students according to certain characteristics of their teachers (i.e. If they have initial training, if they are satisfied with their jobs). Each graph indicates the mathematics test score obtained by students whose teachers have or do not have a given characteristic. Results are given exclusively for analysis categories (i.e. Percentage of students that attend schools with episodes of violence) which are based on 5% or more of the students. By doing so, reliable scores are reported. Countries are shown with an asterisk when the percentage of non responses or missing cases is higher than 20%.
- Differences in mean scores of students whose teachers have or do not have certain characteristics. The independent samples t-test for equal means was used. This report underscores the differences that are statistically significant with a probability of $p \leq 0.05$. All results were weighted to take into consideration the different probability of the cases to be selected for the sample, and to allow for comparisons between education systems. For reasons of statistical reliability, score differences are not reported when one of the categories of analysis contains less than 5% of the cases. When this occurs in an education system, statistical significance is not calculated, and in the graphs the scores are shown with a pink circle.

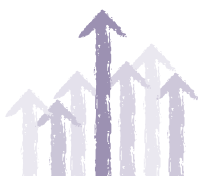


The 'Countries' mean corresponds to the average results of the 15 countries that took part in the study (excluding the Mexican state of Nuevo León). The graphs do not report the statistical significant differences for "Countries' mean". For this reason, circles instead of arrows are shown to indicate these scores.

Student and teacher databases were aggregated to teacher (or classroom) levels to calculate:

- Correlations (Spearman) and regressions (least squares) between average mathematics scores in a classroom, teacher characteristics, and socio-economic of the school. All the results were weighted so as to consider the different probability of the cases to be selected in the sample, and to allow for comparisons between different education systems.

This report includes the results of the analysis of the characteristics of third and sixth grade teachers and their relation with the mathematics test scores obtained by their students. Similar results are expected for the analysis of the scores of the reading test scores, given that mathematics and language teachers tend to be the same in third and sixth grade (and therefore their replies to the survey do not change) and given the medium-high correlation existing between reading and mathematics tests in third ($r = 0.70$) and sixth grade ($r = 0.67$).



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