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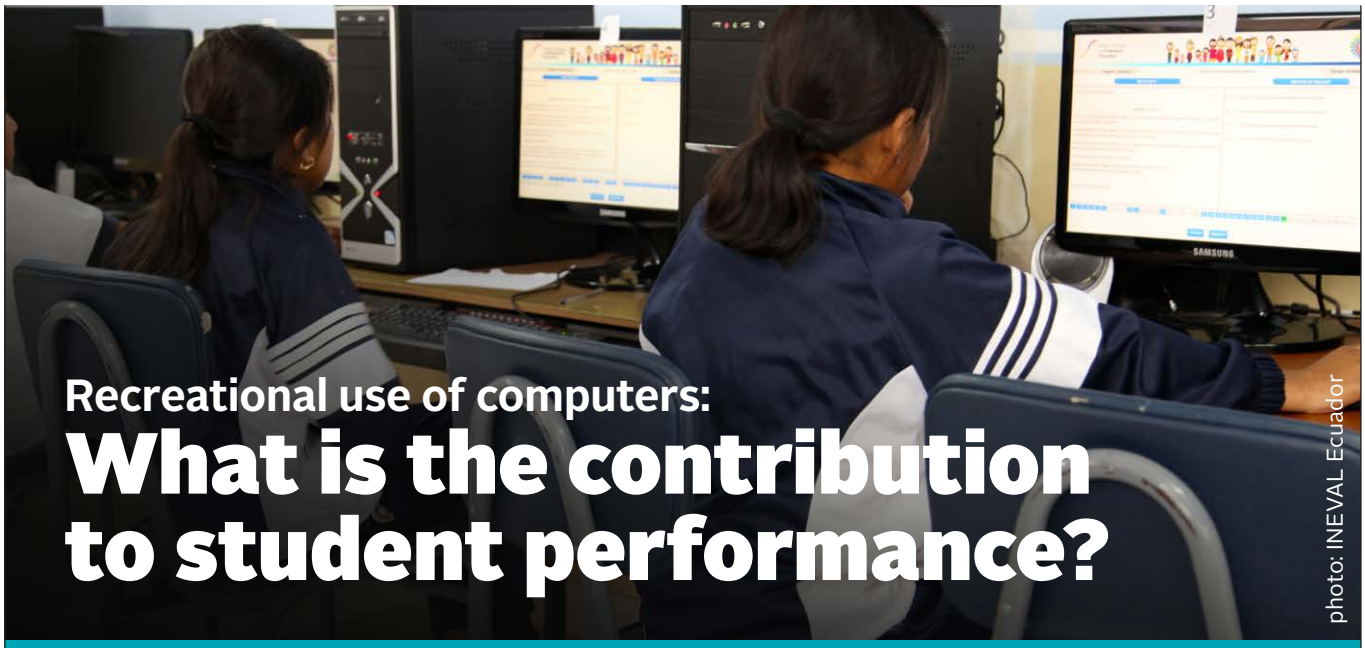
terce
THIRD REGIONAL COMPARATIVE AND EXPLANATORY STUDY

IN SIGHT



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Recreational use of computers: What is the contribution to student performance?

The effect of ICT on student learning achievement is not solely associated with the availability of computers and tablets, among other devices, inside and outside of the academic context. For the effect of ICTs to be positive or negative on learning achievement, other variables should be taken into consideration, such as the type of use, frequency of use, and place of use.

When reviewing in detail the results presented by TERCE, the use of computers for recreational activities, considering the cultural and socioeconomic status, has a negative effect on learning achievement.

The negative effect is more prevalent in natural sciences and less so in reading, albeit a large part of the countries exhibits a negative effect in all of the academic subjects, even when the socioeconomic status is taken into account.

Even though the region of Latin America and the Caribbean has shown great dynamism over the last years, presenting the fastest growth rates in incorporation of technology and connectivity in the world, it still has a long way to go to ensure equal and universal access. Until now, it has not been easy to link this enormous investment and progress with greater and more equitable development, or, in the case of educational systems, with

better learning results for their students (Severin, 2013).

In the framework of its Education 2030 Agenda, UNESCO recognizes that ICT comprise an important potential for educational inclusion. In order to promote lifelong quality learning opportunities for all, it is important to offer flexible learning tracks as well as acknowledgment, validation, and accreditation of knowledge, skills, and competencies acquired through formal and non-formal education, and bolster science, technology, and innovation. In this regard, it is essential to take advantage of information and communication technologies in order to strengthen educational systems, the diffusion of knowledge, access to information, effective and quality education, and a more efficient provision of services (UNESCO, Incheon Declaration, 2015).

SCHOOL ACCESS TO ICT IN LATIN AMERICA

In Latin America, the availability of computer resources is diverse, and it varies depending on the country, resources, and basic infrastructure, such as access to sources of electrical energy. Therefore, the number of schools equipped with electricity provides a measurement of the institutional capacity of the country to promote the use of ICT in education (UNESCO-UIS, 2013).

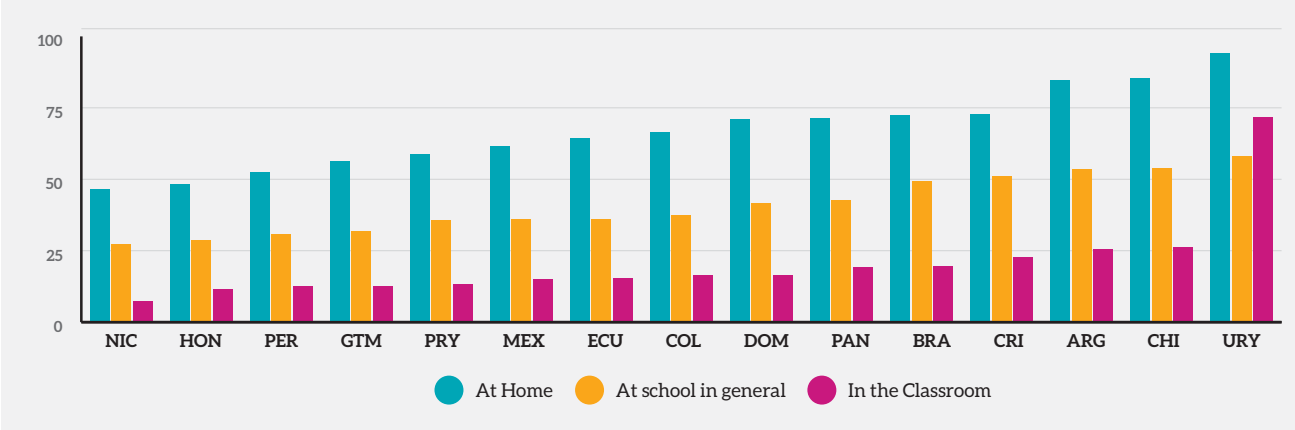
Data from the UNESCO Institute for Statistics from the year 2012 show the contrast in access to ICT within the region, for example in the Dominican Republic, where an average of 122 students in primary education share one single computer. Elementary school students also have little access to computers in Nicaragua (74/1) and Paraguay (130/1), due to the fact that only a quarter of elementary schools in Nicaragua (24%) have electricity.

This contrasts with the current situation in Uruguay, a country in which every child has its own computer (1/1) thanks to their national policy (through the Plan Ceibal) of providing all students and teachers with a laptop computer for free.

In addition to researching the effect of computer use on student performance, TERCE also offers an opportunity to analyze the extent of the use of technology at school and in the homes of students. For this purpose, in Graph 1 the percentage of computer use is presented in three categories that demonstrate the diversity of computer use in each one of the countries, categorized according to the environments in which the student is engaged[1].

1 The categorization by type of environment in which the student is engaged comes from the three questions that sixth-grade students were asked on the questionnaire implemented by TERCE.

Graph 1: Use of computer: at home, in the classroom, at school in general, based on TERCE



Source: *Own elaboration based on TERCE data.* ***Link to Excel file.***

On average, more than 70% of sixth-grade students from the countries participating in TERCE use a computer at home. On average, only 21.1% of students report doing activities on the computer within the classroom. There is a variety of ways of use that are described as general use within school that groups together the ways of use that are available, for example: in the library, the laboratory, or the computer room.

WHAT DOES TERCE TELL US ABOUT COMPUTER USE?

The effect of ICTs on student learning achievement is not solely associated with the availability of computers and tablets, among other types of devices, inside and outside of the academic context. For the effect of the ICT to be positive or negative on learning achievement, other variables should be taken into consideration, such as the type of use, frequency of use, and place of use.

In TERCE's report of associated factors, a first approach is presented regarding the frequency with which computers are used inside and outside of the academic context[2]. The exhibited results suggest two important findings. The first one indicates that the regular use of computers at school is associated consistently with inferior performance. This suggests that their use at school has not been appropriately adapted for educational purposes. Secondly, it has been observed that the

2 *It is worth highlighting that the analysis is limited to sixth-grade students, given that the variable of computer use at school was only included on questionnaires for sixth-grade students. Therefore, the inference from the results is limited to this group of students.*

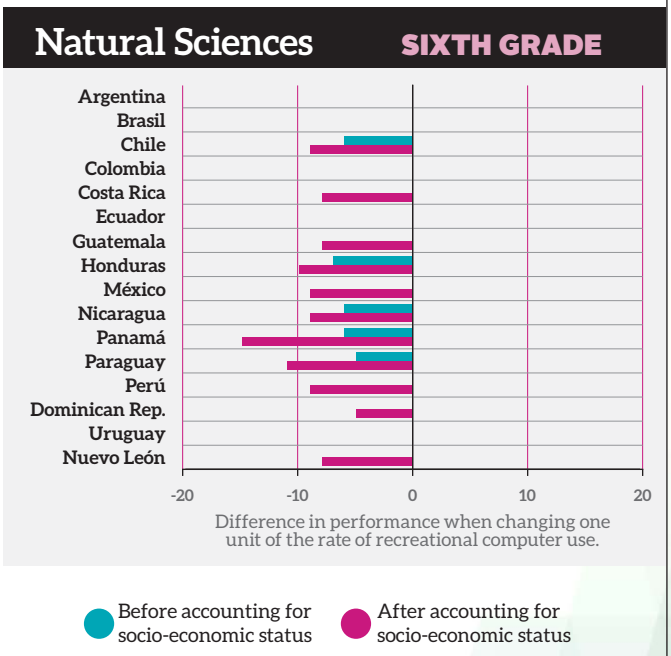
greater the use of a computer at home, the higher are also the academic results of students[3]. However, in some countries, this positive association disappears when the socioeconomic status of the student is accounted (UNESCO/OREALC, 2015. Treviño et al.).

This edition of TERCE in sight explores the scopes regarding the type of computer use for recreational purposes. As noted by Woessmann & Fuchs (2004), the effect of computer use at home and its relationship with student learning achievement depends on the specific use that the computers have. One of the results that the aforementioned research based on PISA data presents, states that the mere availability of computers at home can, at first glance, allow for children to use computers as gaming devices. Therefore, these devices can distract students from their academic activities, thereby affecting student performance.

Through TERCE data it is possible to disaggregate these two elements relative to the use of ICT in education: the duration of computer use and the type of use that these devices have[4]. However, the type of use that it is granted has to do with the type of educational or non-educational experiences of the student.

In the report of associated factors (UNESCO-OREALC, 2015. Treviño et al), it is shown that the recreational use of computers has, on average, negative effects on the learning achievements of students in sixth grade. The more they use their computer, whether for chatting,

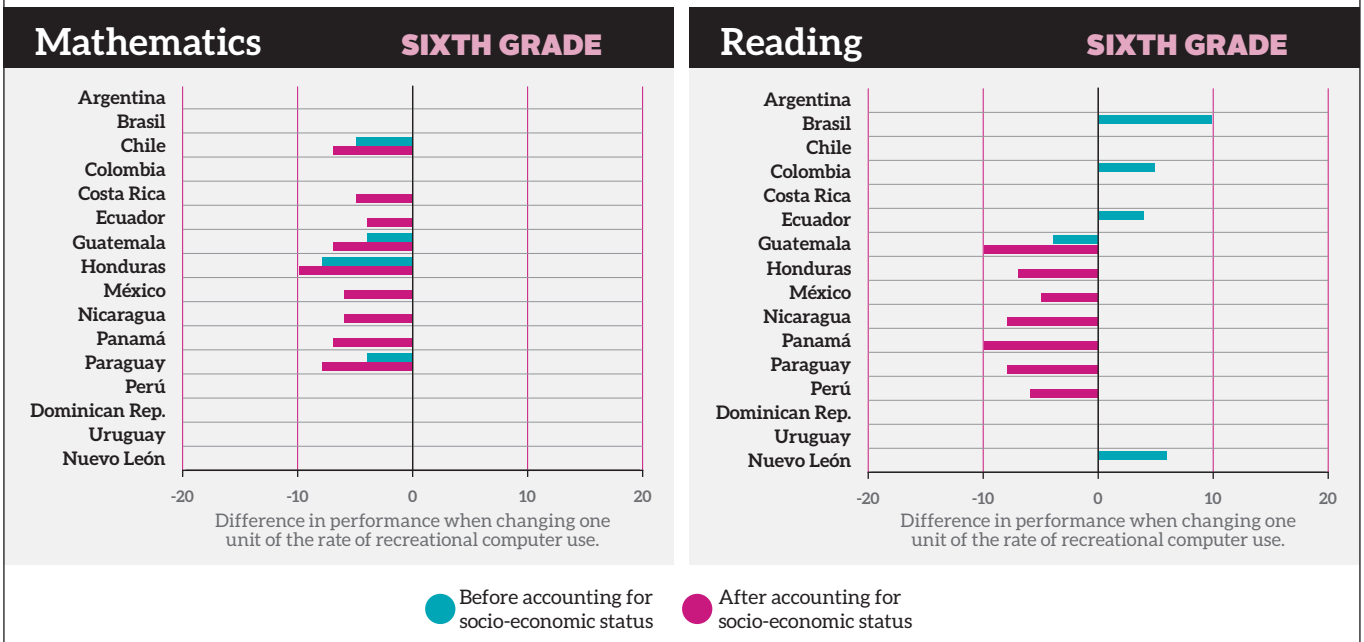
Graph 2: Difference in achievement associated with the change in one unit of the rate of recreational computer use



3 These results must be interpreted with caution and while considering the socioeconomic context in which the students develop; possessing a computer is a variable that itself can give an account of the household socioeconomic level, and therefore explain a large part of the learning achievements of students.

4 The type of use that is examined in TERCE through the questionnaires completed by students, where it specifically asks about the activities that are done during the student's free time and using the computer; for example, playing games, connecting with my friends on social networks (Facebook, Twitter), watching videos or listening to music, and even about the use of computers to search for information and school homework.

Graph 3: Difference in achievement associated with the change in one unit of the rate of recreational computer use



Source: *UNESCO/OREALC. (2015). Treviño et al. Informe de resultados de Factores Asociados.* ***Link to Excel file***

communicating via social networks or listening to music, the lower their achievements are in all assessed subject areas. Greater recreational use of this technology is associated with a loss of between 4 and 15 points on the test scores. Specifically, in mathematics, the recreational use of computers negatively influences learning in nine countries. In reading, this negative relationship occurs in seven countries, while in the natural sciences it occurs in ten countries and in the Mexican state of Nuevo Léon (see Graph).

When the results presented by TERCE are reviewed in detail, the use of computers for recreational activities, considering the cultural and socioeconomic level, has a negative effect on learning achievement. The negative effect is more prevalent in natural sciences and less so in reading, albeit a large part of the countries exhibits a negative effect in all of the academic subjects, even when the socioeconomic level is taken into account.

NOTE GRAPH 2: *The bars indicate the magnitude of the association between academic achievement and the rate of recreational computer use, before and after considering the socioeconomic level of the student and of the school he/she attends. In each country, the difference between light and dark bars indicates the influence of socioeconomic level on the association between recreational computer use and learning achievement. Similar bars suggest a low incidence of the socioeconomic level on this relationship. On the contrary, uneven bars point towards a high incidence. The absence of bars indicates that the relationship was not statistically significant. Significance level was set at 5%.*

CONCLUSIONS AND RECOMMENDATIONS

The use of computers for recreational activities has, on average, a negative relationship with student learning achievement, as demonstrated by TERCE results. In addition to the previous findings presented in the report on associated factors from the study, it suggests that it is not the mere presence of the computer, but rather the type of use, frequency of use, and place of use that determines if the ICT have a negative or positive relationship with academic performance.

Within the framework of its Education 2030 Agenda, UNESCO recognizes the potential that ICT have to improve the learning environments of students. In light of evidence from TERCE, at the same time it establishes that in order for the ICT to have a positive effect on education, it is necessary to have public policies that are comprehensive and contextualized, in a way that higher student performance is achieved. According to Severin (2013), a group of criteria to be considered is established:

I. Consider access to technology and Internet as a right of all students, with States assuming the duty of ensuring access for those who are unable to do it for themselves.

II. Ensure that teachers and families access basic education and training on the use of digital technology, in a way as to appropriately accompany student access.

III. Recognize and point out good educational practices with technology use and encourage access to quality educational resources for all schools and students.

IV. Foster the development of new learning experiences, focused on students through differentiated and personalized pedagogical processes, beginning with pedagogical decision-making based on evidence.

V. Strengthen collaboration in the classroom, in educational centers, and among teachers and students throughout the region, bolstering the development of learning communities and offering educational actions that extend the time and space for learning beyond the school.

VI. Promote the inclusion of the use of ICT with pedagogical purposes in the curriculum of initial teacher training.

VII. Strengthen teacher education to foster personalized, continuous,

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collaborative educational systems in a network, incorporating the generational approach and the gender perspective in the analysis of the use of ICT by teachers, and from there develop training programs adjusted to their needs.

More in depth-research, such as a thematic report on ICT in education from the IDB and OREALC/UNESCO Santiago, will be able to give other leads about how the potential of the ICT can be used for learning.

Coming in our next edition: Teachers

Bibliographical references for TERCE in sight No.2

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Latin American Laboratory for Assessment of the Quality of Education (LLECE)

Third Regional Comparative and Explanatory Study (TERCE)

TERCE Databases

"Terce in sight" is a communicational product of OREALC/UNESCO Santiago aimed at any person interested in educational topics, especially decision-makers. Its objective is to provide analysis on a specific topic that is part of the TERCE findings, and that guides decisions regarding educational policy in the region. The information can be quoted, as long as the source is referenced.