

# Make it smart: Spanish students and ICT

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ICT is one of the eight key competences within the European Framework of Education. Further, the new Spanish Law of Education demands its assessment throughout the education system. By the analyses of the 2000-06 PISA data, we aimed at: 1<sup>st</sup>) offering a vision of ICT availability, use and self-confidence among Spanish students as part of their formal and informal education. 2<sup>nd</sup>) getting some insights about the relationship and impact of students' access and use of ICT on their academic performance.

## 1. Availability and use of ICT resources among Spanish students

### Experience in access

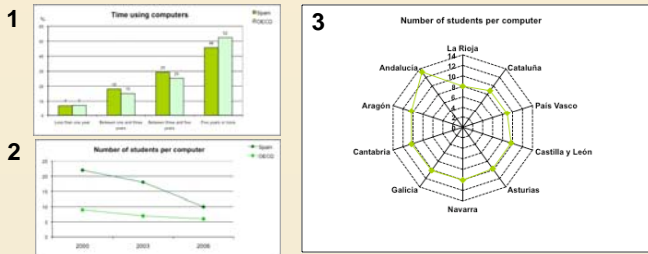
In 2006 the percentage of pupils who have ever used a computer in Spain was 97.8%, very close to the OECD mean in the same year: 98.4%. These figures show that the access to ICT resources in Spain is universally generalized.

### Time

A time gap is noticeable in the access to ICT in Spain and the OECD countries. 46% of Spanish pupils have been using computers for five years or more, whereas the OECD average is 52% (1).

### Evolution in access to ICT at school (2000-2003-2006)

In this period a noteworthy increase in the access to ICT (measured by the ratio 'number of students per computer') has taken place both in the OECD and in Spain (2). Substantial differences for this ratio are perceptible between Spanish regions. Out of ten with available data, seven regions scored average values, whereas the Basque Country, Catalonia and La Rioja scored below (3).

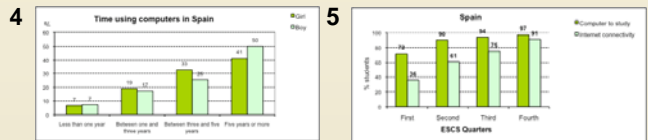


### Perception of ICT impact on teaching and learning (2000-2003-2006)

This was addressed by questioning head teachers to what extent teaching may be hindered by a shortage or inadequacy of ICT in schools. In 2000, around 8% of head teachers in Spain and 10% in the OECD judged ICT shortage as very influential. Contrastingly, in 2003, this percentage in Spain doubled the previous figure. In 2006, however, the feeling about shortage of computers was tempered, probably because the provision of ICT resources had increased.

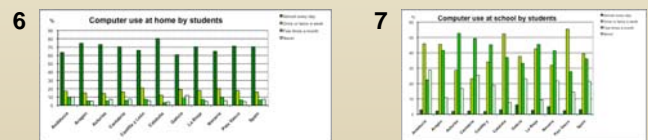
### Differences in access by gender and ESCS

The analysis of pupils' responses draws that boys had access to computers at an earlier age than girls (4). A positive correlation was found between students' socioeconomic background (measured through the PISA index ESCS) and ICT access. This correlation is more evident when Internet connectivity at home is evaluated. Major differences are adamant between the first and the second ESCS quarters (5).



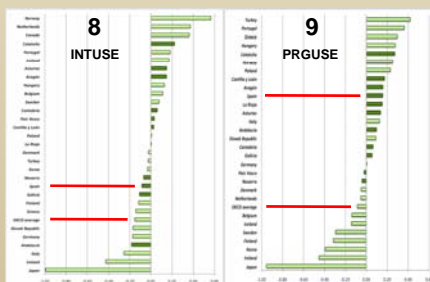
### Use by location

The place where students more frequently work with computers in Spain is 'home'. 70% of pupils claim a daily use and 17% do it once or twice a week. Around 7% of students never use ICT at home. Across regions, figures are quite similar, with the exceptions of Catalonia, Aragón and Galicia (6). Frequency of use of computers 'at school' notably differs from that at home. Only 4% of students report a daily use, while 40% report using it once or twice a week. 22% of Spanish students never use a computer at school, which is a concern, particularly within a governmental policy that highly values the use of ICT for teaching and learning. There is greater heterogeneity across regions in ICT use at school than at home (7).



### Use by function

This was measured by two PISA indexes: INTUSE (8) evaluates Internet browsing for entertainment use. PRGUSE (9) refers the use of computer programmes and educational software. For both indexes, INTUSE and PRGUSE, Spain showed in 2006 an index above the OECD average. Spanish male students display higher values than females, especially for INTUSE. Gender differences were significant in all regions.

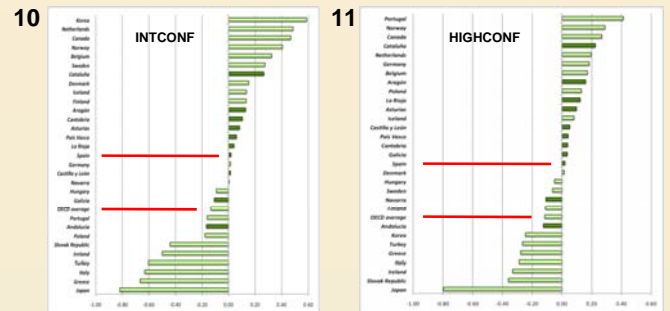


### Use in school lessons

Almost two thirds of students (51% in Catalonia) claim that they never use computers in Science, Spanish, English or Maths. No more than 14% in any region claim to use computers every day or a few times each week for this purpose.

### Self-confidence towards ICT

This was measured by two PISA indexes: INTCONF (self-confidence carrying out tasks through Internet) (10) and HIGHCONF (self-confidence undertaking high level tasks) (11). In both indexes Spain scores significantly above the OECD average. Gender differences are mitigated for INTCONF in practically all Spanish regions. On the contrary, for HIGHCONF, boys scored higher across all regions.



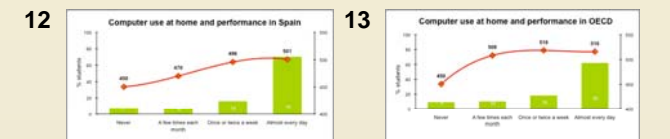
## 2. Relationship between Spanish students' use of ICT and their achievement in Science

### Use of computers at home

A direct correlation exists between frequency of computer use at home and performance in Science, both in Spain and the OECD. In Spain pupils' performance increases gradually with frequency of use and plateau at once or twice a week. In the OECD, however, there is a large breach in pupils' performance between those who never use computers and the rest (12, 13).

### Use of computers in Science lessons

In Spain pupils' performance steadily increases with frequency of use of computers in Science lessons except for the top category 'always', where an important fall (around 40 points) is observed. This is general in all Spanish regions apart from Catalonia. This might be due to a more exhaustive use of ICT by special needs pupils.



## 3. Influence of gender and ESCS in students performance in Science in relation to ICT use

### Gender differences

Frequency of ICT use in Science lessons is positively associated with Science performance both in girls and boys. Differences between the performance of those who use computers frequently and those who never use it go beyond 60 points for girls (14) and 50 for boys (15). There is a considerable amount of missing data in this question (4% girls and 7% boys). Both groups have a very low ESCS mean and their achievement is 40 points below the lowest in their gender.

### ESCS differences

The percentage of students who use computers frequently and whose achievement is high is larger with the increase of ESCS. In the lowest quarter, 71% use computers several times a week with a mean achievement of 462; in the highest quarter, 95% use computers with that frequency and their performance reaches 535.



## Conclusions

Access to ICT in Spain is universally generalized and along the OECD average. A time gap is noticeable between generalization of access in Spain and the OECD although this tends to be minimized. Substantial differences are displayed between the different Spanish regions. Analysis of gender and ESCS reveals that boys had access to computers at an earlier age than girls and a strong correlation between students' ESCS and ICT access. Specific uses of computers and self-confidence are studied through PISA indexes; all show Spain above the OECD average. Male students present higher values than females, particularly for more sophisticated tasks. Worryingly, two thirds of students never use computers at school (2006). A direct correlation between frequency of computer use at home and performance in Science, both in Spain and the OECD, is observed. Pupils' performance gradually increases with frequency of use, especially at low use levels.