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PISA IN FOCUS 52

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How have schools changed over the past decade?

- The quantity and quality of resources available to schools improved significantly between 2003 and 2012, on average across OECD countries. Greater financial investments in education provided schools with better teaching staff, instructional materials and physical infrastructure.
- The learning environment in schools across OECD countries improved between 2003 and 2012, particularly when it comes to teacher-student relations and the proportion of students who arrive late for school.
- The degree to which students from different socio-economic backgrounds attend the same school did not change between 2003 and 2012, while students with different academic abilities and needs were less likely to attend the same school in 2012 than in 2003, on average across OECD countries.

It seems that everyone is talking about improving education. Indeed, over the past decade, governments have invested more in education in an effort to improve the quality of primary and secondary schools. Has this investment paid off?

In every PISA cycle since 2000, students and school principals were asked a series of questions relating to their schools' learning environment – from the adequacy of educational resources and physical infrastructure to the quality of teacher-student relations. By comparing these self-reports over time, PISA can assess whether, and to what extent, the growing concern about, and greater investment in, the quality of education has led to real improvements in schooling.

Schools have more and better resources than a decade ago…

On average across OECD countries with comparable data, cumulative expenditure per student from the age of 6 to the age of 15 increased by 40% in real terms between 2003 and 2012. As a result, most countries and economies participating in PISA have moved towards better-staffed and better-equipped schools. In addition, more qualified teachers are teaching. On average across OECD countries, the share of students attending schools whose principal reported that a lack of qualified mathematics teachers hinders instruction was about five percentage points larger in 2003 (22%) than in 2012 (17%). The incidence of principals reporting shortages of qualified mathematics teachers declined by 10 percentage points or more in 15 countries and economies with comparable data over the period, and by more than 35 percentage points in Turkey and Indonesia. By constrast, statistically significant increases in reports of teacher shortage during the same period were observed in Austria, Finland, Korea, Liechtenstein, Luxembourg, the Netherlands, Switzerland and Thailand.

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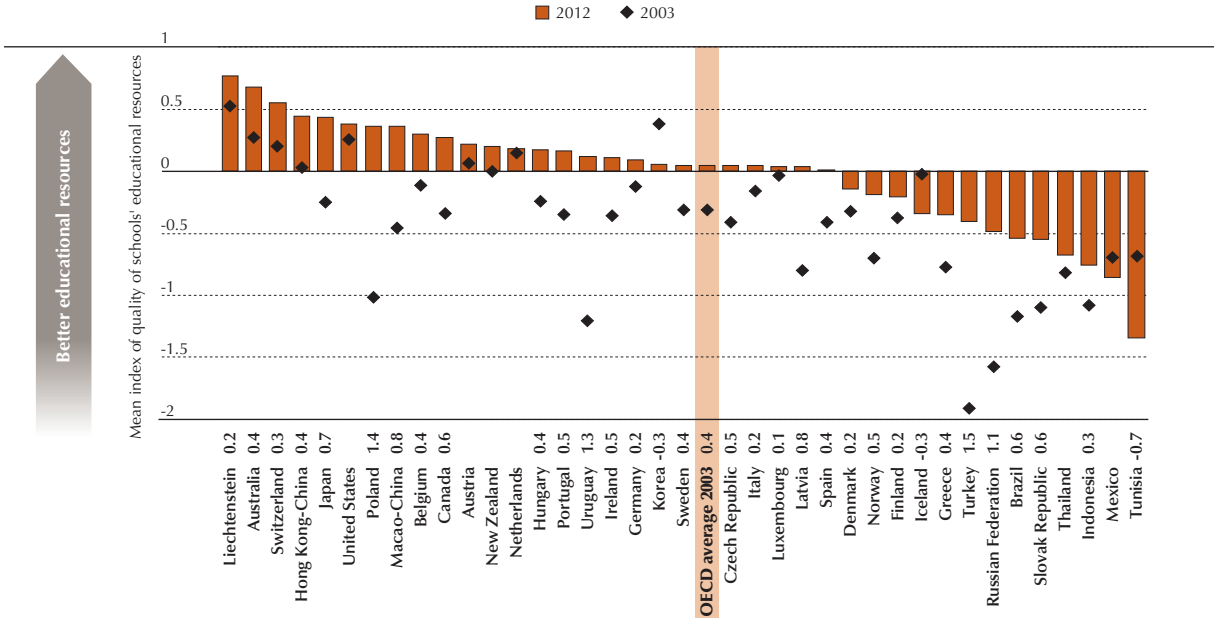
In 29 of the 38 countries and economies with comparable data, the quality of educational materials, such as science laboratory equipment, textbooks, computers and software for instruction, and library materials, also improved, on average, between 2003 and 2012. The largest improvements were observed in Poland, the Russian Federation, Turkey and Uruguay, while a significant deterioration in schools' educational materials was observed in Iceland, Korea and Tunisia.

Trends in the quality of schools' educational materials



Notes: Only countries and economies with comparable data from PISA 2003 and PISA 2012 are shown.
The change in the *index of quality of schools' educational resources* (2012 – 2003) is shown alongside the country/economy name. Only statistically significant differences are shown.
For comparability over time, PISA 2003 values on the *index of quality of schools' educational resources* have been rescaled to the PISA 2012 scale of the index. PISA 2003 results reported in this figure may thus differ from those presented in *Learning for Tomorrow's World: First Results from PISA 2003*, OECD Publishing, Paris.
OECD average 2003 compares only OECD countries with comparable results in 2012 and 2003.
Countries and economies are ranked in descending order of the mean index of quality of schools' educational resources *in PISA 2012.*
Source: OECD, PISA 2012 Database, Table IV.3.43.

StatLink http://dx.doi.org/10.1787/888932957479

Positive trends between PISA 2003 and PISA 2012 are also seen in the quality of physical infrastructure. On average across OECD countries with comparable data, the share of students who attend schools whose principal reported that an inadequacy or shortage of school buildings, heating or cooling systems or instructional space hindered the capacity to provide instruction shrank by six, four and five percentage points, respectively. In a few countries, however, including Korea, Liechtenstein, Luxembourg, the Netherlands, Thailand and Tunisia, the overall quality of physical infrastructure deteriorated significantly during the period.

PISA has shown that having more school resources is not automatically linked to better student performance; but the assessment also finds that having a minimum level of resources is a precondition for high student performance. Thus, it's good news when schools improve the quality of their resources, not because it guarantees better student performance, but because it creates the conditions needed for students to perform at the highest levels.

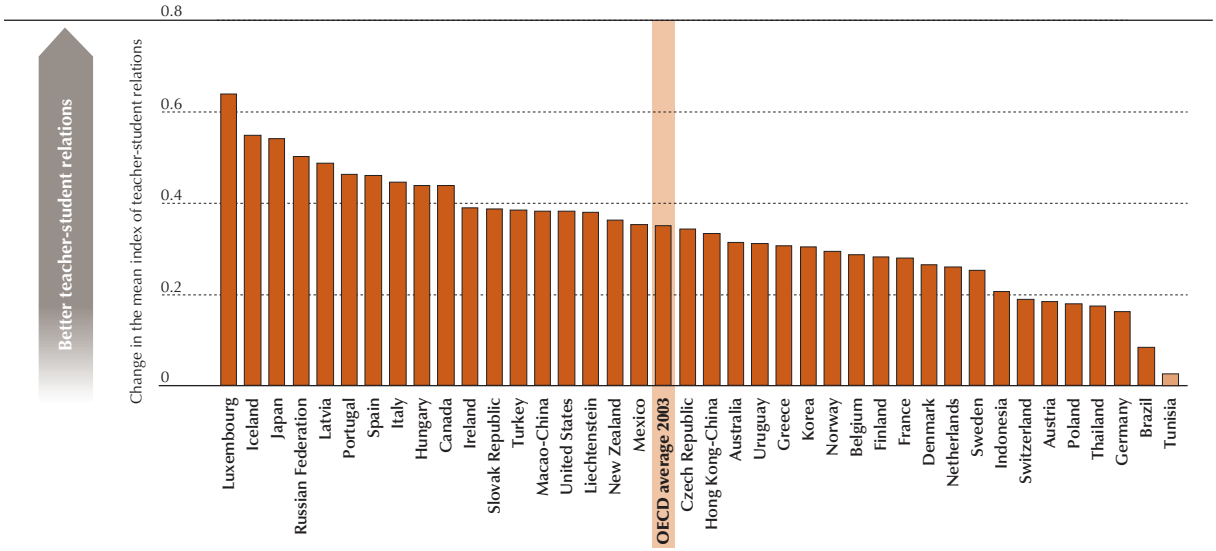
...and the school environment is more conducive to learning.

Additional resources will add nothing to the learning experience unless they are used to create and sustain an orderly and co-operative learning environment. PISA shows a significant correlation between a school's learning environment and student achievement, even after accounting for students' and schools' socio-economic and demographic backgrounds.

On average across OECD countries, the learning environment in schools improved between 2003 and 2012. For example, all countries and economies with comparable data show significant improvements in teacher-student relations during the period, except for Tunisia, where there was no change. On average across OECD countries, the share of

students who reported that they "get along with most teachers" grew by 11 percentage points (from 71% in 2003 to 82% in 2012), and the share of students who reported that "most teachers treat me fairly" increased from 77% in 2003 to 81% in 2012.

Trends in teacher-students relations



Only countries and economies with comparable data from PISA 2003 and PISA 2012 are shown.
Notes: Statistically significant changes between PISA 2003 and PISA 2012 are marked in a darker tone.
Higher values on the index indicate better teacher-student relations.
Countries and economies are ranked in descending order of the change in the index of teacher-student relations *(2012 - 2003).*
Source: OECD, PISA 2012 Database, Table IV.5.17.
StatLink http://dx.doi.org/10.1787/888932957517

Discipline in class also improved, on average across OECD countries, between 2003 and 2012. The Czech Republic, Hong Kong-China, Iceland, Japan, Luxembourg and Norway saw the biggest improvements, while class discipline deteriorated in Germany and Tunisia during the period. And the share of students attending schools where at least one in two students arrived late for school at least once during the two weeks prior to the PISA test decreased from 22% in 2003 to 19% in 2012, indicating less student truancy.

But schools are not more inclusive today than they were a decade ago.

As welcome and significant as these improvements are, OECD countries still face considerable challenges in improving schools' capacity to cater to students' diverse academic abilities and socio-economic backgrounds.

The PISA *index of academic inclusion* measures the degree to which students with different academic abilities and needs share the same school. According to this index, if a larger percentage of the variation in mathematics performance occurs within schools, then academic inclusion is greater. Across OECD countries with comparable data, 36% of performance differences in PISA 2012 were observed between schools and 64% were observed within schools. In 2003, the within-school variation was 2.3 percentage points higher than in 2012. This indicates that schools became less academically inclusive over the past decade. In other words, schools were less likely in 2012 than in 2003 to accommodate both low- and high-achieving students in the same school.

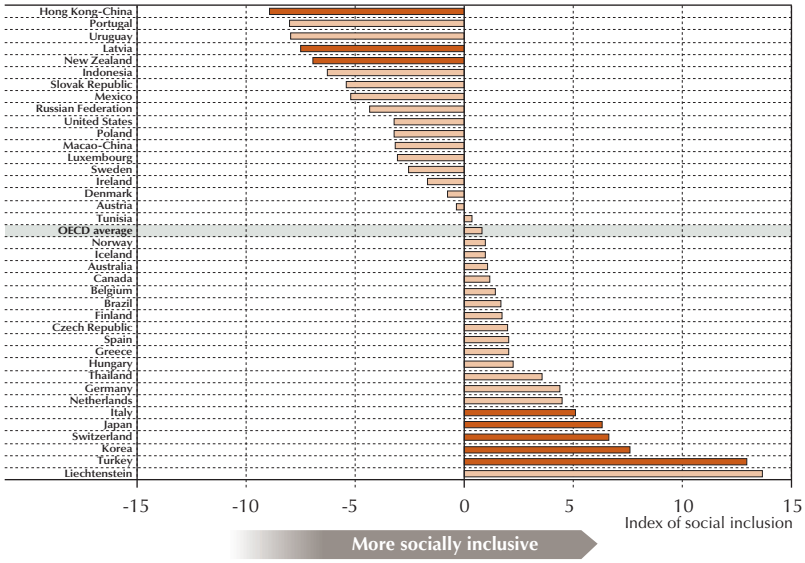
In addition, there has been little change in schools' socio-economic profile over the past decade. The PISA *index of social inclusion measures* the degree to which students from different socio-economic backgrounds attend the same school or the degree to which different schools have different socio-economic profiles. On average across OECD countries with comparable data, about 76% of the variation in students' socio-economic status was observed within schools in both 2003 and 2012. However, this average masks large variations across countries. Schools became significantly less socially inclusive in Hong Kong-China, Latvia and New Zealand, and significantly more socially inclusive in Italy, Japan, Korea, Switzerland and Turkey.

The degree of academic and social inclusion in schools depends on the way students are allocated into schools. In education systems where students are assigned to schools based on their residence, residential segregation, more than education policies, determine the academic and socio-economic composition of schools; yet more affluent

parents often make housing decisions based on the quality of the public schools in their area. In education systems that give parents a greater say in where their children go to school, and where schools admit students based on their academic performance or other individual characteristics, academic and social inclusion is more directly related to education policies. Managing school choice and education policy so that the result is not segregation of students is the great challenge for education systems in the next decade.

Trends in schools' level of social inclusion

Change in the mean of the index of social inclusion between 2003 and 2012



Note: Only countries and economies with comparable data from PISA 2003 and PISA 2012 are shown.
The index of social inclusion is the percentage of the total variation of student socio-economic status found within schools.
Statistically significant differences are marked in a darker tone.
Countries are ranked in ascending order of the difference between 2003 and 2012 (PISA 2012 – PISA 2003) in the PISA index of social inclusion.
Source: PISA 2012 Database, Table II.2.13b.

The bottom line: Although schools are better equipped and staffed today than a decade ago, and provide more positive learning environments for students, there has been no simultaneous improvements in schools' social and academic inclusiveness. Ensuring that disadvantaged and struggling students have access to high-quality schools (e.g. through financial incentives, improving disadvantaged families' access to information, or other mechanisms) can be a way to increase schools' socio-economic and academic inclusion in the future.

For more information

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See OECD (2013), *PISA 2012 Results: Excellence through Equity (Vol. II): Giving Every Student the Chance to Succeed*, OECD Publishing, Paris, *http://www.oecd.org/pisa/keyfindings/pisa-2012-results-volume-II.pdf.*
OECD (2013), *PISA 2012 Results: What Makes Schools Successful? (Vol. IV): Resources, Policies and Practices*, OECD Publishing, Paris, *http://www.oecd.org/pisa/keyfindings/pisa-2012-results-volume-IV.pdf.*

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