2. Debunking some myths

International tests such as PISA hold up a mirror to show countries how they are performing compared with other school systems. They also reveal the many false assumptions that can stand in the way of improving education.

The poor will always do badly in school; deprivation is destiny

Even as teachers in classrooms around the world struggle to make up for the disadvantage into which some of their students were born, some believe that deprivation is destiny. But PISA results show that this is a false premise – and that there is nothing inevitable about how well or badly different social groups are likely to do in school, or in life.

There are two sides to this story. On the one hand, in all countries that participate in PISA, learning outcomes are associated with the social background of students and schools – a major challenge for teachers and schools.[1] But on the other hand, the strength of the relationship between social background and the quality of learning outcomes varies substantially across education systems – proof that poor results are not inevitable for disadvantaged students. In the 2012 PISA test, the 10% most disadvantaged 15-year-olds in Shanghai showed better mathematics results than the 10% most privileged students in the United States and many other countries.[2] Similarly,

in the 2015 PISA assessment, the 10% most disadvantaged students in Estonia and Viet Nam performed as well as the average student in OECD countries (see ***FIGURE 1.1***).

So if the poorest students in Estonia, Shanghai and Viet Nam can perform as well as the average student in Western countries, why shouldn't the poorest children in these other countries do as well as their counterparts in Estonia, Shanghai and Viet Nam?

Children from similar social backgrounds can show large differences in performance, depending on the school they go to or the country in which they live. Countries where disadvantaged students succeed are able to moderate social inequalities. Some of them are able to attract the most talented teachers to the most challenging classrooms and the most capable school leaders to the most disadvantaged schools, and provide their educators with whatever support they need to succeed. They apply high standards and challenge all students to meet them. They use methods of instruction that allow students from all backgrounds to learn in the ways that are most suitable and effective for them.

All countries have some excellent students, but few have enabled most students to excel. Achieving greater equity in education is not only a social-justice imperative, it is also a way to use resources more efficiently, and to ensure that all people can contribute to their societies. In the end, how we educate the most vulnerable children reflects who we are as a society.

Some American critics contend that the value of international comparisons of education is limited because the United States has a uniquely large share of disadvantaged students. But the United States has actually many socio-economic advantages over other countries. It is wealthier, and spends more money on education, than most countries; older Americans have higher levels of education than their counterparts in most other countries which, in turn, is a big advantage for their children; and the share of socio-economically disadvantaged students is just around the OECD average.

What past PISA comparisons have shown was that, in the United States, socio-economic disadvantage had a particularly strong impact on student performance. In other words, in the United States, the learning outcomes of two students from different socio-economic backgrounds varied much more than was typically observed in OECD countries.

A PISA primer

The heart of PISA is an internationally agreed set of tests in mathematics, reading, science and a number of innovative domains that is conducted every three years among representative samples of 15-year-old students in the participating countries. The age of 15 was chosen as the point of comparison because it represents the last point at which schooling is still largely universal.

PISA is closely aligned with the OECD Programme for the International Assessment of Adult Competencies (PIAAC), which measures literacy, numeracy, and information and communication technology (ICT) skills among 16-65 year-olds. While PISA looks backwards to establish how effectively school systems have established the foundations for success in life, PIAAC looks forward to how initial skills feed into further learning and important economic, employment and social outcomes.

PISA assesses both subject content knowledge and students' ability to apply that knowledge creatively, including in unfamiliar contexts.

The basic survey design has remained constant since it was first used, in 2000, to allow for comparability from one PISA assessment to the next. This enables countries to relate policy changes to improvements in education outcomes over time.

Considerable efforts are devoted to achieving cultural and linguistic breadth and balance in assessment materials. Stringent quality-assurance mechanisms are applied in the test design, translation, sampling and data collection.

PISA is a collaborative effort. Leading experts in participating countries decide on the scope and nature of the PISA assessments, and the background information collected. Governments oversee these decisions based on shared, policy-driven interests.

But this is where the story becomes interesting: PISA results from the United States also show how the vicious cycle of disparities in schooling outcomes, leading to more unequal life chances and reduced social mobility can be broken.

Between 2006 and 2015 the association between social background and student performance in the United States weakened more than in any other PISA-participating country. Think about it this way: in 2006, fewer than one in five of the most disadvantaged American 15-year-olds was able to achieve excellent performance in science; in 2015, nearly one in three was able to do so. So the share of students who could potentially realise the American dream of social mobility rose by 12 percentage points within a decade. Even if the achievement gap between advantaged and disadvantaged students in the United States persists, these data show how much improvement is possible – and how quickly it can be achieved (***FIGURE 2.1***).

Immigrants lower the overall performance of school systems

In recent years, many thousands of migrants and asylum-seekers – including an unprecedented number of children – have braved rough seas and barbed-wire barricades to find safety and a better life in Europe. Are our schools prepared to help immigrant students integrate into their new communities? And will they succeed in preparing all students for a world in which people are willing and able to collaborate with others from different cultural backgrounds? Many believe it is simply impossible to do so.

But consider the following: results from PISA show no relationship between the share of students with an immigrant background in a country and the overall performance of students in that country (***FIGURE 2.2***). Even students with the same migration history and background show very different performance levels across countries. The education immigrants had acquired before migrating matters, but where immigrant students settle seems to matter much more.

For example, children of Arab-speaking immigrants who had settled in the Netherlands scored 77 points – or the equivalent of two school years – higher in

science than students from the same countries who had settled in Qatar, even after accounting for socio-economic differences between the students. They also scored 56 points higher than their peers who had settled in Denmark.

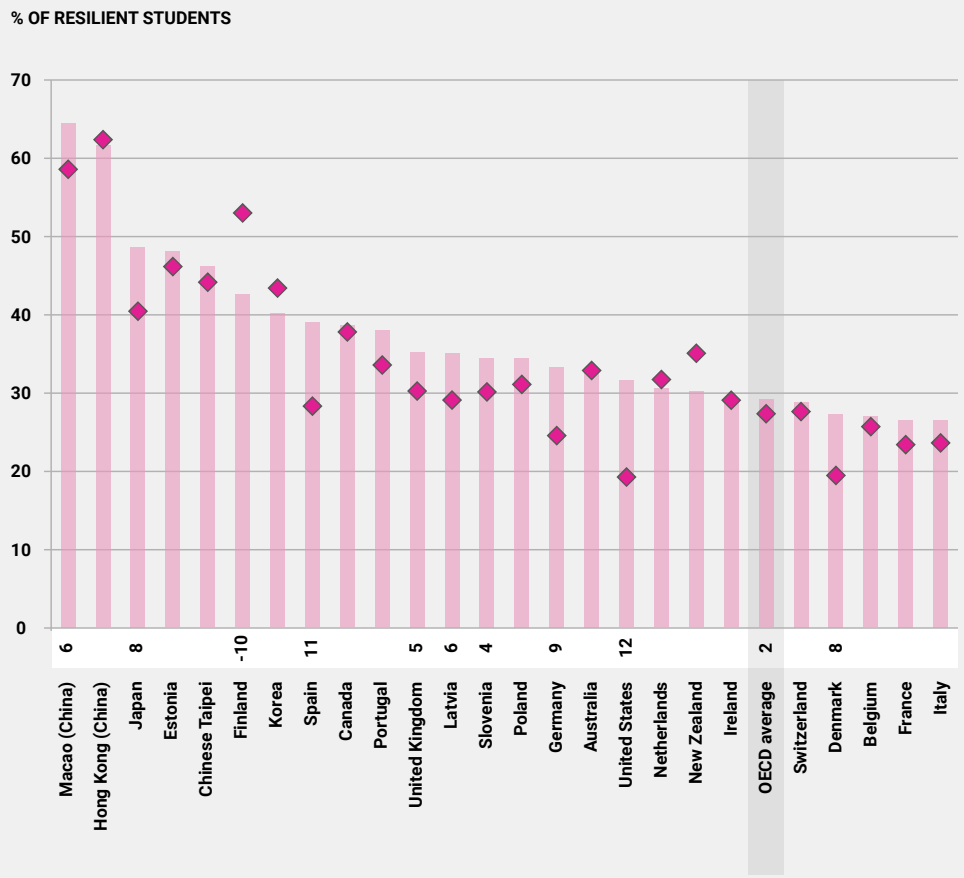
Students born in China who move elsewhere do better than their native peers in virtually every destination country; but here, too, the destination country matters. In Australia, first-generation Chinese immigrants scored 502 points, similarly to their Australian peers, but second-generation Chinese immigrants scored 592 score points, well over two school years ahead of their Australian peers. In other words, and to the extent that social background adequately captures cohort effects, these immigrant students were able to benefit more from the Australian school system than Australian students without an immigrant background, even after accounting for the students' socio-economic status.

Across OECD countries, the performance gap between immigrant students and students without an immigrant background narrowed between 2006 and 2015. This change was particularly striking in Belgium, Italy, Portugal, Spain and Switzerland.[3]

For instance, immigrant students in Portugal improved their science performance by 64 score points during the period – the equivalent of roughly two school years – while students without an immigrant background improved by 25 points. Immigrant students in Italy improved their scores in science by 31 points and immigrant students in Spain improved by 23 points, while in both countries the performance of students without an immigrant background remained stable. In none of the countries can demographic changes in the immigrant population account for these improvements. In both Italy and Spain, for example, the proportion of immigrant students with educated parents was about 30 percentage points lower in 2015 than in 2006.

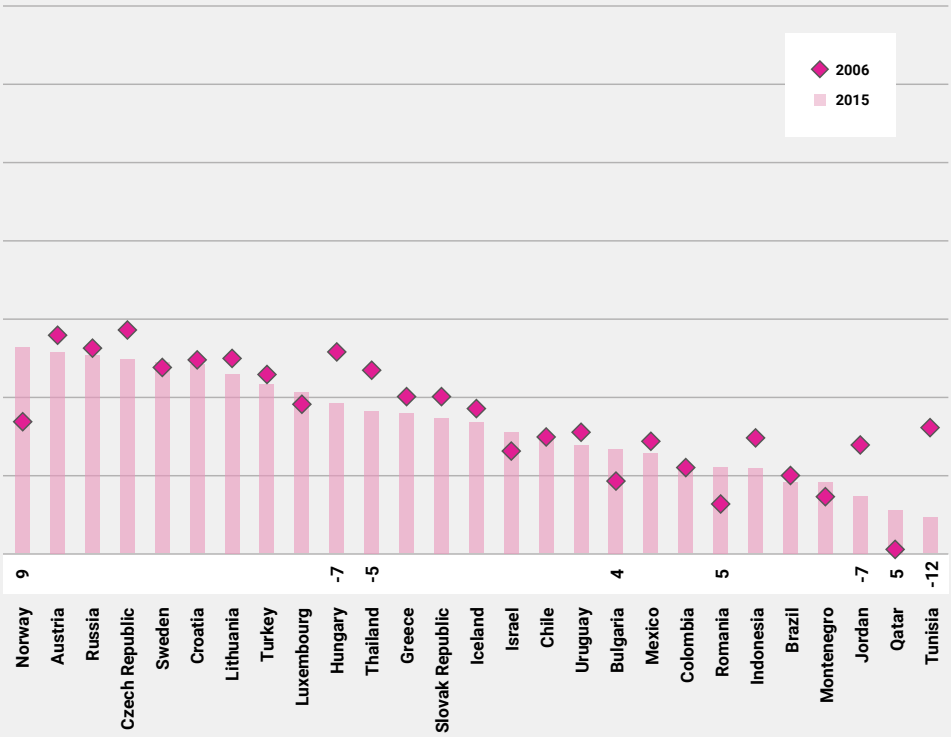
These improvements show that there is considerable scope for policy and practice to help students with an immigrant background realise their potential.

FIGURE 2.1: DISADVANTAGED STUDENTS CAN BEAT THE ODDS AGAINST THEM AND BE AMONG THE WORLD'S TOP PERFORMERS



Notes: A student is considered resilient if he or she is in the bottom quarter of the PISA index of economic, social and cultural status but performs in the top quarter of students among all countries, after accounting for socio-economic status.

The percentage-point difference between 2006 and 2015 in the share of resilient students is shown next to the country/economy name. Only statistically significant differences are shown.



Countries and economies are ranked in descending order of the percentage of resilient students in 2015.

Source: OECD, PISA 2015 Database, Table I.6.7.

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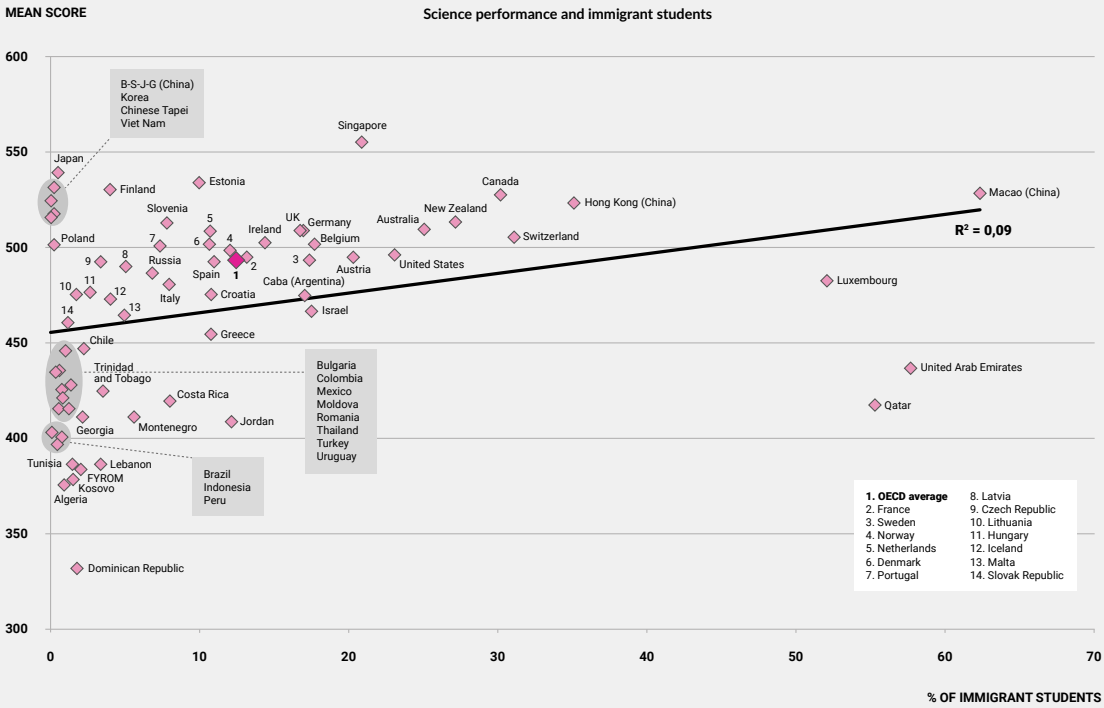
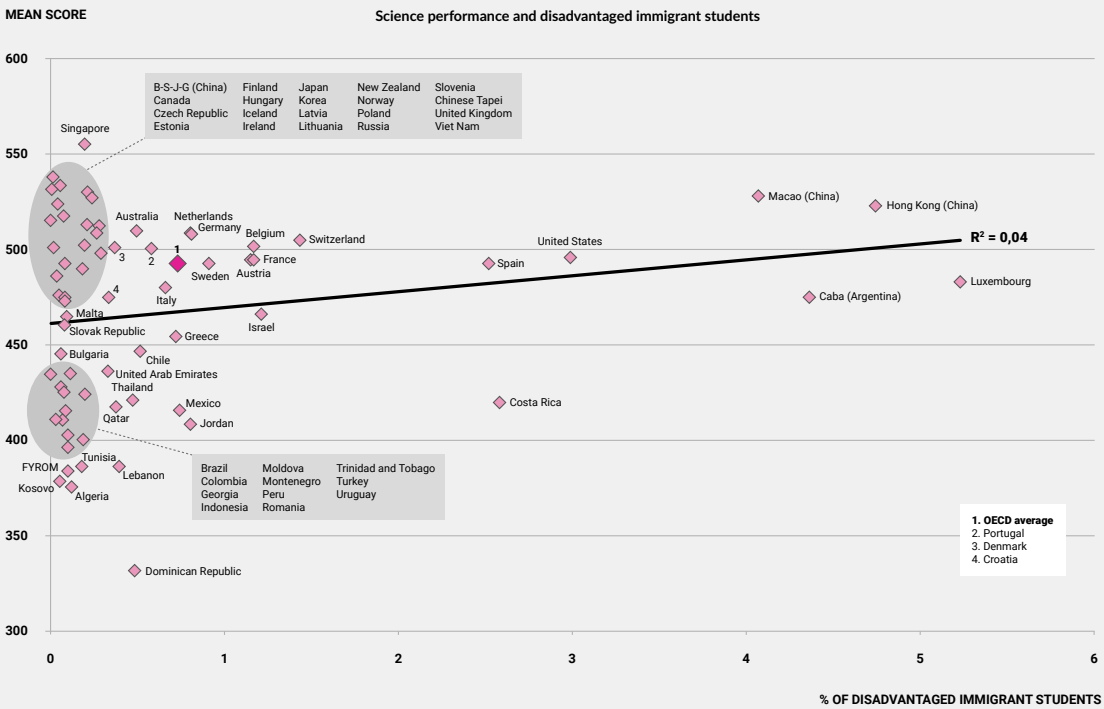
FIGURE 2.2: THE POPULATION OF IMMIGRANT STUDENTS IS UNRELATED TO A COUNTRY'S AVERAGE PERFORMANCE





Notes: B-S-J-G (China) refers to Beijing-Shanghai-Jiangsu-Guangdong (China). CABA (Argentina) refers to Ciudad Autónoma de Buenos Aires (Argentina). FYROM refers to the Former Yugoslav Republic of Macedonia.

Source: OECD, PISA 2015 Database, Table I.7.3.

StatLink *http://dx.doi.org/10.1787/888933432897*

Success in education is all about spending more money

Countries need to invest in education if their citizens are to lead productive lives; but putting more money into education does not automatically result in better education.

For countries that currently invest less than USD 50 000 per student between the ages of 6 and 15, PISA shows a strong relationship between spending per student and the quality of learning outcomes. However, for countries that spend above that level, and that includes most OECD countries, there is no relationship between spending per student and average student performance (***FIGURE 2.3***).

Fifteen-year-old students in Hungary, which spends USD 47 000 per student between the ages of 6 and 15, perform at the same level as students in Luxembourg, which spends more than USD 187 000 per student, even after accounting for differences in purchasing power parities. In other words, despite spending four times as much as Hungary, Luxembourg does not gain any advantage.

In short, success is not just about how much money is spent, but about how that money is spent.

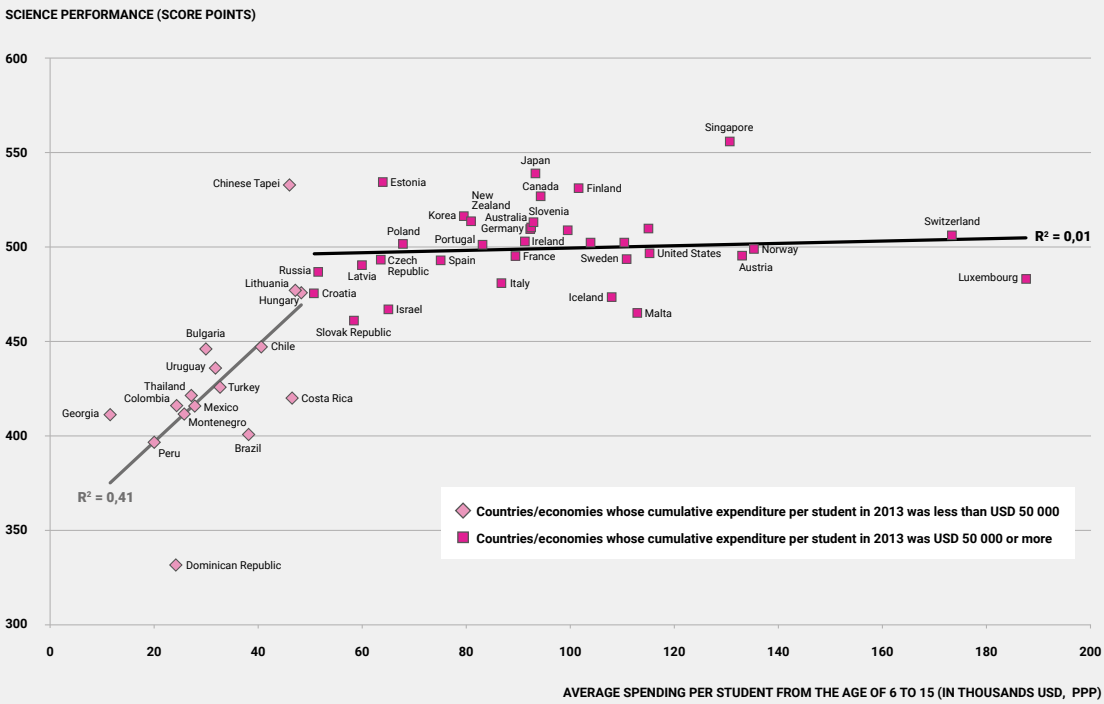
Smaller classes always mean better results

It might be politically popular to argue for smaller classes, but there is no cross-national evidence to show that reducing class size is the best avenue towards improving results. Instead, reducing class size can mean diverting funds that would have been better spent elsewhere – such as higher pay for better teachers.

In fact, the highest-performing education systems in PISA tend to prioritise the quality of teachers over the size of classes; whenever they have to choose between smaller classes and investing in their teachers, they go for the latter.

It may be that reducing class size opens up opportunities for new and more effective instructional practice, and that, all else being equal, smaller classes lead to better outcomes. But that is often the wrong way to look at it, because countries can spend their money only once. Reducing class size means that less money is available

FIGURE 2.3: AFTER A CERTAIN THRESHOLD, THERE IS NO RELATIONSHIP BETWEEN SPENDING PER STUDENT AND AVERAGE PERFORMANCE



Notes: Only countries and economies with available data are shown. A significant relationship ($p < 0.10$) is shown by the black line. A non-significant relationship ($p > 0.10$) is shown by the grey line. Spending figures are adjusted for differences in purchasing power parities.

Source: OECD, PISA 2015 Database, Tables I.2.3 and II.6.58.

StatLink *http://dx.doi.org/10.1787/888933436215*

to raise teachers' salaries, provide teachers with opportunities to do things other than teaching, or increase student learning time.

Despite the lack of evidence proving the benefits of smaller classes, many countries continue to make them a priority. Teachers, parents and policy makers favour small classes because they see them as the key to better and more personalised education. Between 2005 and 2014, popular pressure and changing demographics pushed governments to reduce class size in lower secondary education by an average of 6% across OECD countries.[4]

But during roughly the same period, between 2005 and 2015, the salaries of lower-secondary teachers increased by only 6% in real terms, on average across OECD countries, and actually decreased in a third of OECD countries. Lower-secondary teachers are now paid only 88% of what other tertiary-educated full-time workers earn.[5] If teachers' salaries are not competitive, teachers will not invest in themselves; and even if they do, they are likely to leave the profession if their expertise is better used, recognised and more highly compensated elsewhere.

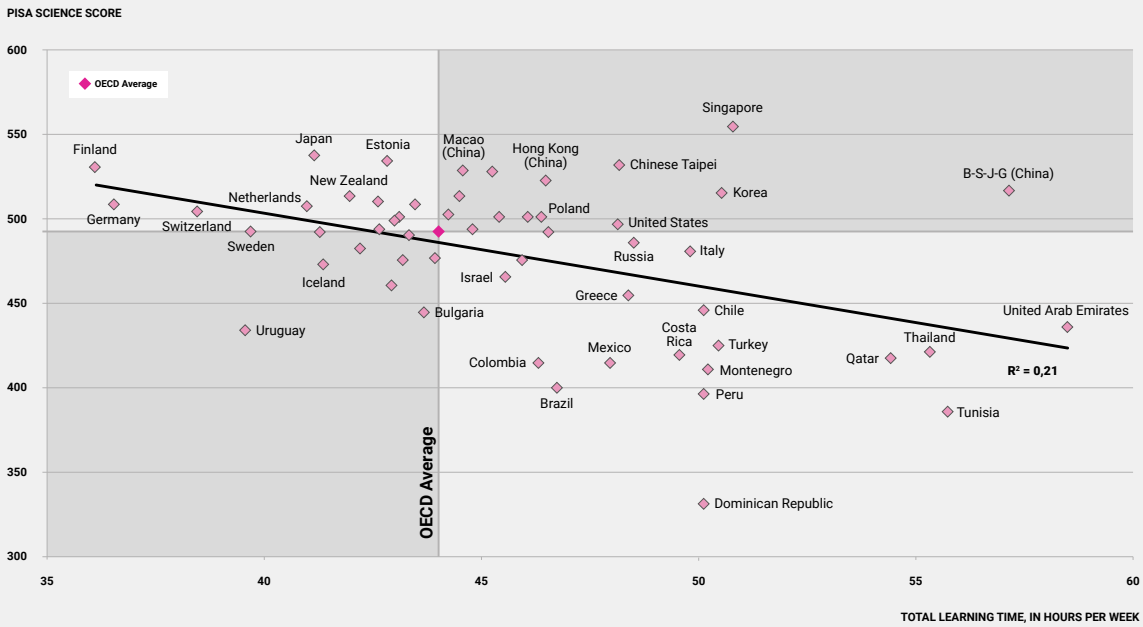
More time spent learning yields better results

School systems differ widely in how much time students spend learning, particularly after school hours. Within each country, more learning time for a subject tends to be associated with better learning outcomes in that subject.[6] So policy makers and parents who lobby for longer school days have a point. But when we compare countries in this regard, the relationship is turned on its head: countries with longer classroom hours and learning time often do worse in PISA (***FIGURE 2.4A***). How can that be?

It's actually quite straightforward. Learning outcomes are always the product of the quantity and quality of learning opportunities. When keeping the quality of instruction constant, adding more time will yield better results. But when countries improve the quality of instruction, they tend to achieve better results without increasing student learning time.

For instance, in Japan and South Korea, students score similarly in science; however, in Japan, students spend about 41 hours per week learning (28 hours at

FIGURE 2.4A: COUNTRIES WITH LONGER LEARNING TIME ARE NOT NECESSARILY AMONG THE BEST PERFORMERS



Notes: B-S-J-G (China) refers to Beijing-Shanghai-Jiangsu-Guangdong (China). Total learning time includes time spent in school, on homework, in additional instruction and on private study.

Source: OECD, PISA 2015 Database, Figures I.2.13 and II.6.23.

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school and 14 hours after school), all subjects combined, whereas in South Korea they spend 50 hours per week (30 hours at school and 20 hours after school). In Tunisia and in Beijing, Shanghai, Jiangsu and Guangdong, the four municipalities and provinces of China that participated in the PISA 2015 assessment, students spend 30 hours per week learning at school, and 27 hours after school, but the average science score in the Chinese cities/provinces is 531 points whereas in Tunisia it is 367 points (***FIGURE 2.4B***). These differences might be indicative, among other things, of the quality of a school system and the effective use of student learning time, as well as whether students can learn informally after school.

Most parents would like to see their children in schools where they can acquire solid academic knowledge and skills but also have enough time to participate in non-academic activities, such as theatre, music or sports, which develop their social and emotional skills, and contribute to their well-being. It is always a question of balance. Finland, Germany, Switzerland, Japan, Estonia, Sweden, the Netherlands, New Zealand, Australia, the Czech Republic and Macao (China) all seem to provide a good balance between learning time and academic performance.

Success in education is all about inherited talent

The writings of many educational psychologists have nurtured the idea that student achievement is mainly a product of inherited intelligence, not hard work. PISA doesn't only test what 15-year-olds know, it also asks students what they believe is behind success or failure in such tests. In many countries, students were quick to blame everyone but themselves. In 2012, more than three in four students in France, an average performer on the PISA test, said that the course material was simply too hard; two in three said that the teacher did not pique students' interest in the material; and one in two said that their teacher did not explain the concepts well or that they, the students, were just unlucky.[7]

The results were very different for Singapore. Students there believed they would succeed if they tried hard; they trusted their teachers to help them succeed. The fact that students in some countries consistently believe that achievement is mainly a

product of hard work rather than inherited intelligence suggests how school systems and the wider society can make a difference in students' attitudes towards school and achievement.

One of the most consequential findings from PISA is that, in most of the countries where students expect to have to work hard to achieve, virtually all students consistently meet high performance standards (see Chapter 3).

A comparison between school marks and students' performance in PISA also shows that, after accounting for students' reading proficiency, study habits and attitudes towards school and learning, socio-economically advantaged students tend to receive higher marks on their schoolwork from their teachers than their more disadvantaged peers do.[8] This practice could have far-reaching – and long-lasting – consequences for two reasons: students often base their expectations of further education and careers on the marks they receive in school; and school systems use marks to guide their selection of students for academically oriented programmes and, later, for entry into university.

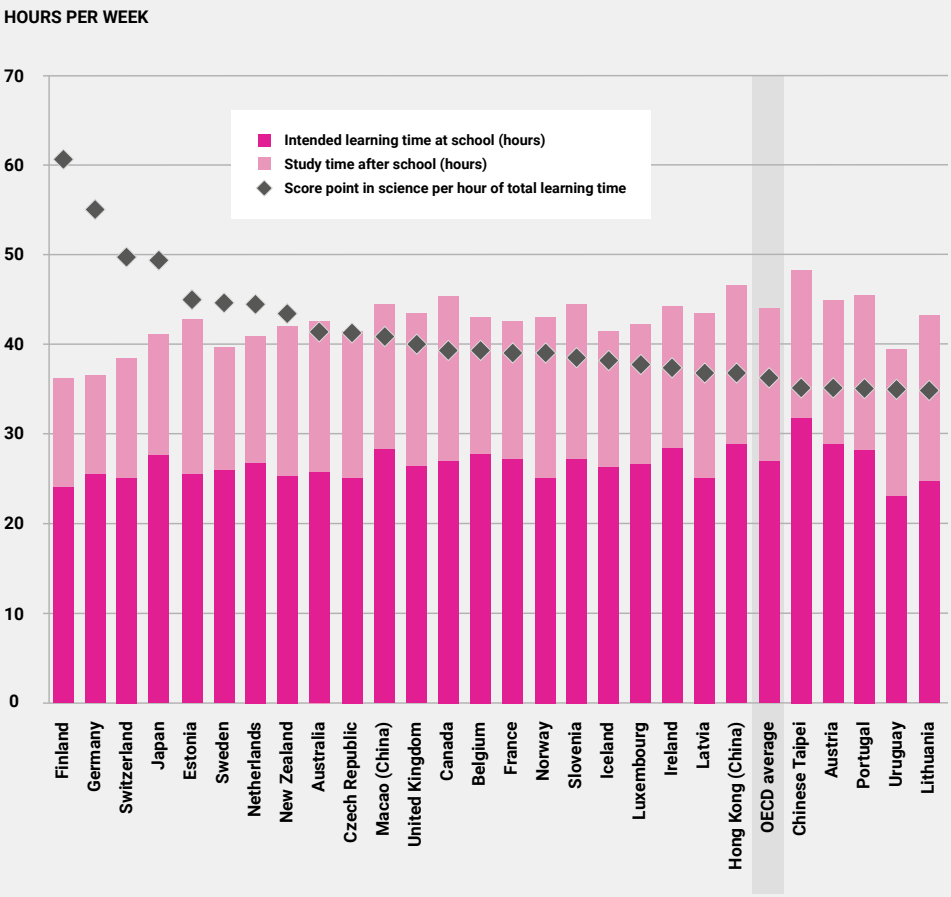
In short, it is unlikely that school systems will achieve performance parity with the best-performing countries until they accept that, with enough effort and support, all children can learn and achieve at high levels.

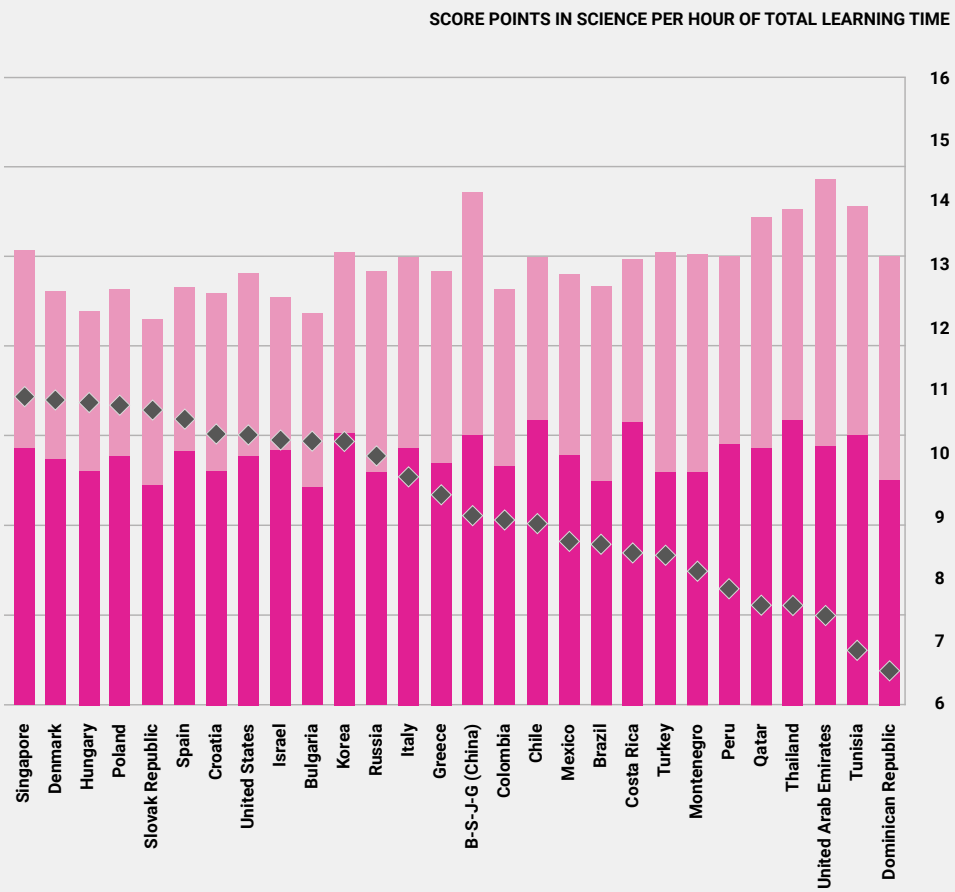
Some countries do better in education because of their culture

Some argue that comparing the education systems of countries with widely different cultures is pointless because education policies and practices are based on different underlying norms and traditions. As such, they are applicable only in similar cultural contexts or, if they are adopted by countries with different cultural norms, they would produce different results.

Culture can, indeed, influence student achievement. Countries with cultures based on the Confucian tradition, for example, are known to value education and student achievement in school highly. Many observers believe that this cultural characteristic confers a large advantage on these countries.

FIGURE 2.4B: STUDENT PERFORMANCE DEPENDS ON BOTH THE QUANTITY AND QUALITY OF LEARNING TIME





Notes: The diamonds show the mathematics score per hour of total learning time. Total learning time includes the hours of intended learning time in school for all subjects as well as hours spent learning in addition to the required school schedule, including homework, additional instruction and private study. B-S-J-G (China) refers to Beijing-Shanghai-Jiangsu-Guangdong (China).

Source: OECD, PISA 2015 Database, Figure II.6.23.

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But not all countries that share that tradition perform at high levels in PISA. A Confucian heritage might be an asset, but it is no guarantee of success. Other top-performing countries in PISA, such as Canada and Finland, show that valuing education is not unique to Confucian cultures.

The strongest argument against culture as the determining factor in success is the rapid improvement in student performance observed in so many different places. For example, mean performance in science improved significantly between 2006 and 2015 in Colombia, Israel, Macao (China), Portugal, Qatar and Romania. Over this period, Macao (China), Portugal and Qatar grew the share of top-performing students and simultaneously reduced the share of low-performing students.

These countries and economies did not change their culture, or the composition of their populations, nor did they change their teachers; they changed their education policies and practices. Given these results, those who claim that the relative standing of countries in PISA mainly reflects social and cultural factors must concede that culture is not just inherited, it can also be created – through thoughtful policy and practice.

Only top graduates should become teachers

One of the claims I have heard most frequently from people trying to explain poor learning outcomes in their country is that their young people who go into teaching are not from among the country's best and brightest. High-performing countries, they say, are able to recruit their teachers from among the top third of graduates.

It sounds plausible, since the quality of a school system will never exceed the quality of its teachers. And, certainly, top school systems select their teaching staff carefully. But does that mean that, in those countries, the top graduates chose to become teachers rather than, say, lawyers, doctors or engineers?

It is hard to know for certain because it is difficult to obtain comparative evidence on the knowledge and skills of teachers. But the Survey of Adult Skills tested the literacy and numeracy skills of adults – including teachers. Using these data, it is possible to compare the skills of teachers with those of other college and university graduates.[9]

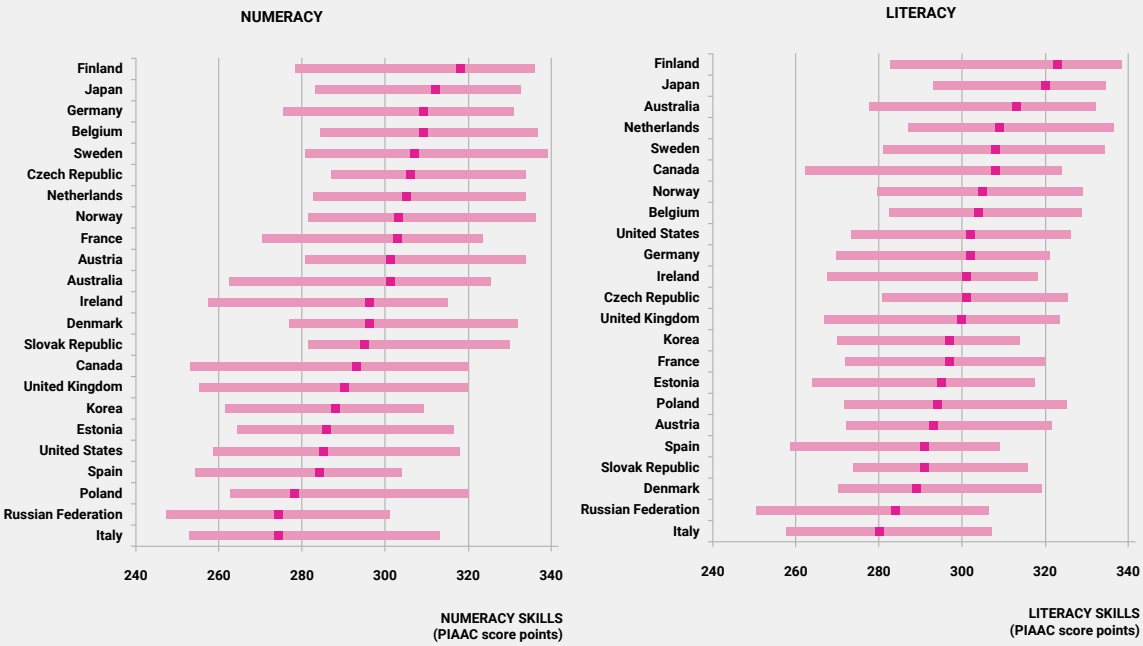
The results show that, among the countries with comparable data, there is no single country where teachers are among the top third of adults with a college degree (based on average proficiency in numeracy and literacy); and there is no country where they are among the bottom third of college graduates (***FIGURE 2.5A***). In fact, in most countries, teachers' skills are similar to those of the average person with a college degree. There are just a few exceptions. In Finland and Japan, for example, the average teacher has better numeracy skills than the average college graduate, while in the Czech Republic, Denmark, Estonia, the Slovak Republic and Sweden, the reverse is true.

But there is another way to look at this. While in every country teachers tend to score similarly to college graduates on the Survey of Adult Skills, the knowledge and skills of graduates differ substantially across countries – and these differences are reflected among teachers too. Teachers in Japan and Finland come out on top in terms of their numeracy skills, followed by their Flemish (Belgium), German, Norwegian and Dutch counterparts. Teachers in Italy, the Russian Federation, Spain, Poland, Estonia and the United States come out at the bottom in numeracy skills.

One study[10] found that there is a positive relationship between teachers' and students' skills (***FIGURE 2.5B***). However, in some countries, such as Estonia and South Korea, teachers' proficiency in numeracy is average, but their students are top performers in the PISA mathematics test. In addition, in most high-performing countries, students score above what would be expected based solely on the average knowledge and skills of the teachers in those countries. This suggests that other factors, in addition to teachers' skills, are related to students' high performance.

All in all, unless countries have the luxury of hiring teachers from Finland or Japan, they need to think harder about making teaching a well-respected profession and a more attractive career choice – both intellectually and financially. They need to invest more in teacher development and competitive employment conditions. If not, they will be caught in a downward spiral – from lower standards of entry into the teaching profession, leading to lower self-confidence among teachers, resulting in more prescriptive teaching and thus less personalisation in instruction, which could drive the most talented teachers out of the profession entirely. And that, in turn, will result in a lower-quality teaching force.

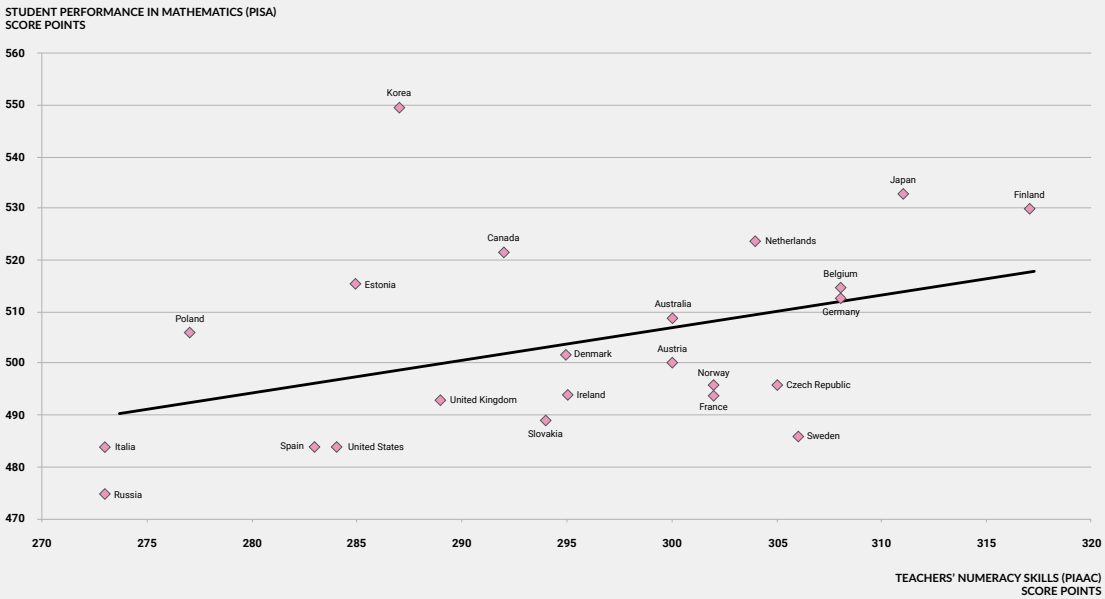
FIGURE 2.5A: TEACHERS ARE NEITHER MORE NOR LESS SKILLED THAN THE AVERAGE COLLEGE GRADUATE



Notes: The dark segment indicates median cognitive skills of teachers in a country. The horizontal bars show the interval of cognitive skill levels of all college graduates (including teachers) between the 25th and 75th percentile. Countries are ranked by the median teacher skills in numeracy and literacy, respectively.

Source: Adapted from Hanushek, Piopiunik and Wiederhold (2014), The Value of Smarter Teachers: International Evidence on Teacher Cognitive Skills and Student Performance.

FIGURE 2.5B: STUDENT PERFORMANCE IS RELATED TO, BUT NOT NECESSARILY DEPENDENT ON, TEACHERS' SKILLS



Source: Adapted from Hanushek, Piopiunik and Wiederhold (2014), The Value of Smarter Teachers: International Evidence on Teacher Cognitive Skills and Student Performance.

Selecting students by ability is the way to raise standards

For centuries educators have wondered how they should design school systems so that they best serve all students' needs. Some countries have adopted non-selective and comprehensive school systems that seek to provide all students with similar opportunities, leaving it to each teacher and school to cater to the full range of student abilities, interests and backgrounds. Other countries respond to diversity by grouping or tracking students, whether between schools or between classes within schools, with the aim of serving students according to their academic potential and/or interests in specific programmes. Conventional wisdom says that the former serves equity, while the latter fosters quality and excellence.

The assumption underlying selection policies is that students' talents will develop best when students reinforce each other's interest in learning.

There is considerable variation in how countries track and stream students.[11] Evidence from PISA shows that none of the countries with a high degree of separation by ability, whether in the form of tracking, streaming, or grade repetition, is among the top-performing education systems or among the systems with the largest share of top performers. The highest-performing systems are those that offer equitable opportunities to learn to all of their students.

This is consistent with other research that shows that narrowing the range of student abilities in classes or schools through tracking does not result in better learning outcomes.[12] The pattern is different for within-class ability grouping or subject-specific ability grouping, which has shown to be effective when appropriate adjustments are made to the curriculum and instruction.

It used to be sufficient for only some students to succeed in school, because our societies and economies needed a relatively small cohort of well-educated people. With the social and economic cost of poor performance in school rising every day, it has become not just socially unjust but also highly inefficient to organise school systems on the basis of exclusion. Equity and inclusion are imperative in modern education systems and their societies.

Now that I've debunked some of the myths about what influences learning outcomes, it is time to analyse what makes high-performing education systems different.