In which countries and schools do disadvantaged students succeed?

PISA in Focus #80

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In which countries and schools do disadvantaged students succeed?

- Despite being from among the poorest 25% in their country, one in four disadvantaged students is academically resilient, meaning that he or she performs at Level 3 or above in all three core PISA subjects.
- In Canada, Denmark, Estonia, Finland, Germany, Hong Kong (China), Ireland, Japan, Korea, the Netherlands, Norway, Singapore, Slovenia and Viet Nam, more than 30% of disadvantaged 15-year-old students are academically resilient.
- Across the vast majority of education systems, schools in which students have the greatest chances of being academically resilient share some common attributes – chief among which is a good disciplinary climate, meaning that students can focus in class and teachers can provide well-paced instruction.

Most of the students who perform poorly in PISA come from socio-economically disadvantaged backgrounds. But some of their similarly disadvantaged peers beat the odds working against them and excel in PISA.

Some countries are better than others at helping the most disadvantaged students succeed in school.

PISA 2015 data show that, on average across OECD countries, as many as three out of four students from the lowest quarter of socio-economic status reach, at best, only the baseline level of proficiency (Level 2) in reading, mathematics or science. While in Canada, Denmark, Estonia, Finland, Germany, Hong Kong (China), Ireland, Japan, Korea, the Netherlands, Norway, Singapore, Slovenia and Viet Nam, more than 30% of disadvantaged students scored at Level 3 or above in all PISA subjects in 2015, and can thus be considered "academically resilient", in Algeria, the Dominican Republic, Kosovo, Peru and Tunisia, less than 1% of the disadvantaged students who were eligible to participate in the PISA 2015 test performed at that level.

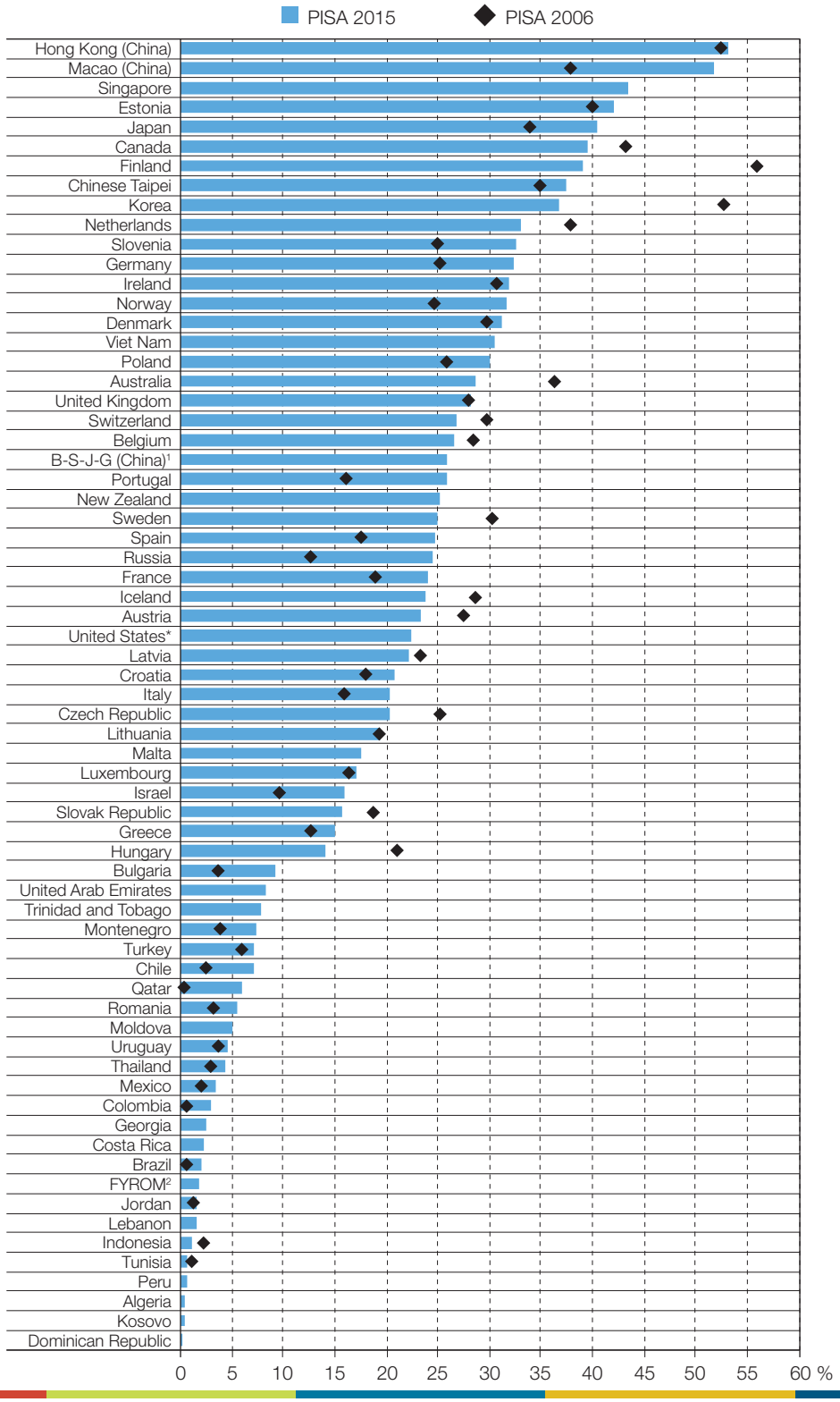
Students who perform at Level 3 begin to demonstrate the ability to construct the meaning of a text and form a detailed understanding from multiple independent pieces of information when reading. They can work with proportional relationships and engage in basic interpretation and reasoning when solving mathematics problems; and they can handle unfamiliar topics in science. Such skills are the foundations for success and further learning later in life.

The variation in the share of academically resilient students across countries and time largely reflects differences in the outcomes achieved by all students, on average. The smallest shares of resilient students are found in countries where average performance is low, even among more advantaged students. But this variation also reflects disparities in how equitably learning opportunities are distributed. For example, in Denmark and Switzerland, about 49% of students score at or above Level 3; but the association between socio-economic status and performance is significantly stronger in Switzerland and, as a result, the share of resilient students is significantly smaller there than in Denmark.

PISA data collected over a decade (in 2006, 2009, 2012 and 2015) show that several countries have been able to increase the share of academically resilient students among those in the bottom quarter of socio-economic status. Out of the 51 education systems for which the share of resilient students can be compared between 2006 and 2015, 19 saw increases in the proportion of resilient disadvantaged students; 9 saw the share of these students shrink. Among OECD countries, the increase was particularly pronounced in Germany, Israel, Japan, Norway, Poland, Portugal, Slovenia and Spain. For example, in 2006, only around one in four disadvantaged students in Germany reached Level 3 proficiency or higher in all three academic subjects tested in PISA. By 2015, as many as one in three did. Meanwhile, in Australia, Finland, Hungary, Korea, New Zealand and Sweden the share of these students shrank during the same period. In Finland, in 2006 almost 56% of disadvantaged students were resilient; by 2015, only 39% were.

How many disadvantaged students succeed in PISA?

Percentage of students from the lowest quarter of socio-economic status who perform at Level 3 or above in reading, mathematics and science



1. B-S-J-G (China) refers to the four PISA-participating China provinces and municipalities: Beijing, Shangai, Jiangsu and Guangdong.
2. FYROM refers to the former Yugoslav Republic of Macedonia.

Notes: PISA 2006 results are missing for countries that did not participate in PISA 2006.

* PISA 2006 results in reading are not available for the United States.

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

Source: OECD, PISA 2006 and PISA 2015 Databases.

School factors related to student resilience

Among disadvantaged students, the likelihood of performing at or above Level 3 in reading, mathematics and science is positively/negatively related to:

NS Relationship is not significant | Positive relationship | Negative relationship

	School resources			School climate	
	Average size of language-of-instruction class	Ratio of computers available to students to the number of students in the modal grade for 15-year-old students	Number of extracurricular activities at school	Share of students who had not skipped a day of school during the two weeks prior to the PISA test	Classroom climate conducive to learning
OECD average		NS			
OECD					
Australia	NS	NS	NS	NS	
Austria	NS	NS		NS	
Belgium		NS			
Canada		NS			
Chile	NS	NS	NS		
Czech Republic		NS	NS		
Denmark	NS	NS	NS		
Estonia	NS	NS	NS		
Finland	NS	NS	NS	NS	NS
France	NS	NS	NS	NS	NS
Germany	NS	NS		NS	
Greece	NS		NS		
Hungary	NS	NS			
Iceland	NS	NS	NS	NS	NS
Ireland		NS	NS	NS	
Israel	NS			NS	
Italy	NS	NS	NS		
Japan		NS		NS	
Korea	NS				
Latvia	NS	NS	NS		
Luxembourg	NS		NS	NS	NS
Netherlands		NS	NS		
New Zealand	NS				NS
Norway	NS	NS	NS		
Poland	NS	NS	NS		NS
Portugal		NS	NS		
Slovak Republic		NS	NS	NS	
Slovenia			NS		
Spain	NS	NS	NS		
Sweden	NS	NS	NS		NS
Switzerland	NS		NS		
Turkey	NS	NS	NS	NS	
United Kingdom		NS	NS	NS	
United States		NS	NS	NS	
Partners					
B-S-J-G (China)	NS	NS	NS	NS	
Bulgaria		NS			
Croatia		NS	NS		
Hong Kong (China)		NS	NS		
Lithuania	NS		NS		
Macao (China)			NS		
Montenegro	NS	NS	NS		
Qatar	NS	NS		NS	
Romania	NS				
Russian Federation		NS	NS		
Singapore		NS	NS		
Chinese Taipei	NS	NS			
United Arab Emirates	NS	NS		NS	
Viet Nam	NS		NS		NS

Notes: Results based on multi-level logistic models, including controls for the PISA cycle (2012 or 2015), students' gender, socio-economic status and language spoken at home, as well as for schools' average socio-economic profile. Only countries/economies in which more than 5% of disadvantaged students are academically resilient are included in the analysis.
Classroom climate conducive to learning is measured by the school-average PISA indices of disciplinary climate in science lessons (PISA 2015) and of disciplinary climate in mathematics lessons (PISA 2012).
Countries and economies are listed by OECD/partner status and in alphabetical order.
Source: PISA 2012 and PISA 2015 Database.

Countries that grew the percentage of resilient students did so either by raising mean levels of achievement (thereby improving the quality of schooling provided), or by reducing the extent to which socio-economic status explains proficiency (thereby enhancing equity). Many of the fastest improvers, such as Germany, did so through a combination of improvements in the quality of the learning opportunities for all students, and improvements that affected the most socio-economically disadvantaged students in particular.

Disadvantaged students thrive when the school climate is orderly and conducive to learning.

The likelihood that disadvantaged students are academically resilient varies not only across countries, but also within each education system, depending on the school these students attend. An in-depth analysis of PISA data from 2012 and 2015 focused on the subset of countries and economies where at least 5% of disadvantaged students are academically resilient. The analysis identified some traits common to school environments in which disadvantaged students succeed.

Across the vast majority of education systems examined, the likelihood that disadvantaged students are resilient is higher in schools where students reported a good disciplinary climate, compared to schools with more disruptive environments, even after accounting for differences in students' and schools' socio-economic profile and other individual characteristics associated with resilience. Attending orderly classes, in which students can focus and teachers provide well-paced instruction, is beneficial for all students, but particularly so for the most vulnerable. A similar relationship is found with the share of students who did not skip days of schools during the two weeks prior to the PISA test, another indicator of (a positive) school climate.

By contrast, the likelihood of resilience among disadvantaged students is only weakly related to the amount of human and material resources available in their schools. Student-computer ratios, for example, are unrelated to the share of resilient students, after accounting for the disciplinary climate and student background; and the number of extracurricular activities is only weakly related to this share, on average across countries. In many countries, disadvantaged students are more likely to be resilient in schools that offer many extracurricular activities (and have the resources to do so); however, the average association between resilience and extracurricular activities is weak, and some countries even show a negative association between extracurricular activities and student resilience.

In most countries, class size is positively related to resilience, meaning that disadvantaged students who attend schools with larger classes tend to be more successful academically. But this relationship might also reflect the fact that policy makers compensate for student disadvantage by reducing the size of classes.

In most countries, there is no correlation between indicators of school resources and the share of resilient students; but that does not mean that investments in education do not matter. Rather, the finding suggests that resources help disadvantaged students succeed in school only if they improve the aspects of the learning environment that are most directly linked to students' opportunities to learn.

The bottom line

Socio-economically disadvantaged students often encounter obstacles that prevent them from developing their full potential at school – and thus limit their ability to contribute to society and benefit from learning opportunities later on in life. Removing these obstacles is one of the principal goals for education systems. By ensuring that disadvantaged students learn in orderly classrooms, and enriching their learning with purposeful extracurricular activities, schools can be at the vanguard of creating more inclusive and fair societies.

For more information

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See: Agasisti, T., F. Avvisati, F. Borgonovi and S. Longobardi, *Academic resilience: What schools and countries do to help disadvantaged students succeed in PISA,* OECD Education Working Papers Series No. 167, http://dx.doi.org/10.1787/19939019.

Coming next month: What do science teachers find most satisfying about their work?

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