PISA 2012
Evaluating school systems to improve education

Andreas Schleicher
PISA in brief

• Over half a million students...
  – representing 28 million 15-year-olds in 65 countries/economies

... took an internationally agreed 2-hour test...
  – Goes beyond testing whether students can reproduce what they were taught...
  – to assess students’ capacity to extrapolate from what they know and creatively apply their knowledge in novel situations
  – Mathematics, reading, science, problem-solving, financial literacy
  – Total of 390 minutes of assessment material

... and responded to questions on...
  – their personal background, their schools and their engagement with learning and school

• Parents, principals and system leaders provided data on...
  – school policies, practices, resources and institutional factors that help explain performance differences.
High mathematics performance

Mean score ... Shanghai-China performs above this line (613)

Singapore
Chinese Taipei
Hong Kong-China
Korea
Macao-China
Japan
Liechtenstein
Switzerland
Netherlands
Estonia
Finland
Canada
Belgium
Germany
Viet Nam
Austria
Australia
Ireland
Slovenia
Denmark
New Zealand
Czech Republic
France
United Kingdom
Iceland
Latvia
Luxembourg
Norway
Portugal
Italy
Spain
Russian Fed.
Slovak Republic
United States
Lithuania
Sweden
Hungary
Croatia
Israel
Greece
Serbia
Turkey
Romania
Bulgaria
U.A.E.
Kazakhstan
Thailand
Chile
Malaysia
Mexico

26% of American 15-year-olds do not reach PISA Level 2
(OECD average 23%, Shanghai 4%, Japan 11%, Canada 14%, Some estimate long-term economic cost to be US$72 trillion)

Average performance of 15-year-olds in Mathematics
Fig I.2.13
Socially equitable distribution of learning opportunities

High mathematics performance

Average performance of 15-year-olds in mathematics

Singapore
Hong Kong-China
Korea
Macao-China
Japan
Liechtenstein
Switzerland
Netherlands
Estonia
Finland
Canada
Viet Nam

Singapore
Hong Kong-China
Korea
Macao-China
Japan
Liechtenstein
Switzerland
Netherlands
Estonia
Finland
Canada
Viet Nam

Strong socio-economic impact on student performance

Low mathematics performance
Strong socio-economic impact on student performance

Socially equitable distribution of learning opportunities
Countries with better performance in mathematics tend to allocate educational resources more equitably.

30% of the variation in math performance across OECD countries is explained by the degree of similarity of educational resources between advantaged and disadvantaged schools.

Adjusted by per capita GDP

OECD countries tend to allocate at least an equal, if not a larger, number of teachers per student to disadvantaged schools; but disadvantaged schools tend to have great difficulty in attracting qualified teachers.
The American dream of social mobility

In some countries it is close to a reality
A resilient student is situated in the bottom quarter of the *PISA index of economic, social and cultural status* (ESCS) in the country of assessment and performs in the top quarter of students among all countries, after accounting for socio-economic status.

Socio-economically *disadvantaged students* not only score lower in mathematics, they also report lower levels of engagement, drive, motivation and self-beliefs. Resilient students break this link and share many characteristics of advantaged high-achievers.
Performance of countries in a level playing field

How the world would look if students around the world were living in similar social and economic conditions
Mean mathematics score at the country level before adjusting for socio-economic status

Mean mathematics score at the country level after adjusting for socio-economic status

US would rank lower in a level playing field:
• Ranks 3rd in wealth per person (explains 12%)
• Ranks 5th in spending per student
• Has average share of disadvantaged students
• Ranks 6th in parental attainment
• Has 6th largest share of immigrant students (explains 4%)
It is not just about poor kids in poor neighbourhoods...

...but about many kids in many neighbourhoods
Across OECD, 13% of students are top performers (Level 5 or 6). They can develop and work with models for complex situations, and work strategically with advanced thinking and reasoning skills.
Countries that grant schools autonomy over curricula and assessments tend to perform better in mathematics.

Fig IV.1.15

Mathematics performance (score points) vs. Index of school responsibility for curriculum and assessment (index points)
School autonomy for curriculum and assessment \times system’s extent of implementing a standardised math policy (e.g. curriculum and instructional materials)

Schools with more autonomy perform better than schools with less autonomy in systems with standardised math policies.

Fig IV.1.16
Schools with more autonomy perform better than schools with less autonomy in systems with more collaboration.

School autonomy for resource allocation $\times$ System's level of teachers participating in school management
Across all participating countries and economies

Fig IV.1.17
Schools with more autonomy perform better than schools with less autonomy in systems with more accountability arrangements.
Percentage of students in schools whose principal reported that their schools have the following for quality assurance and improvement:

- Written specification of the school’s curriculum and educational goals
- Written specification of student-performance standards
- Systematic recording of data, including teacher and student attendance and graduation rates, test results...
- Teacher mentoring
- External evaluation
- Internal evaluation/self-evaluation
- Written feedback from students (e.g. regarding lessons, teachers or resources)
- Regular consultation with one or more experts over a period of at least six months with the aim of improving...
- Implementation of a standardised policy for mathematics

![Figure IV.4.14](Shanghai-China_OECD_averages.png)
Lessons from high performers

Catching up with the top performers

- High impact on outcomes
- High feasibility
  - Quick wins
  - Low hanging fruits
- Low impact on outcomes
- Low feasibility
  - Money pits
  - Must haves
Lessons from high performers

- High impact on outcomes
  - Quick wins
    - Resources where they yield most
    - Gateways, instructional systems
  - A learning system
    - Incentive structures and accountability

- Low impact on outcomes
  - Money pits
  - Low hanging fruits

- High feasibility
  - Coherence
    - Capacity at point of delivery
  - Commitment to universal achievement

- Low feasibility
  - Must haves
    - Resources where they yield most
    - Gateways, instructional systems
  - A learning system
    - Incentive structures and accountability

- Capacity at point of delivery
  - Commitment to universal achievement

- Incentive structures and accountability
  - Resources where they yield most
  - Gateways, instructional systems

- Low feasibility
  - Money pits
  - Low hanging fruits

- High feasibility
  - Coherence
    - Capacity at point of delivery
  - Commitment to universal achievement
Lessons from high performers

Average performers

Some students learn at high levels
Routine cognitive skills, rote learning
Few years more than secondary
‘Tayloristic’, hierarchical
Primarily to authorities

Top performers

All students need to learn at high levels
Learning to learn, complex ways of thinking, ways of working
High-level professional knowledge workers
Flat, collegial
Primarily to peers and stakeholders

Student inclusion
Curriculum, instruction and assessment
Teacher quality
Work organisation
Accountability

What it all means
Find out more about PISA at www.pisa.oecd.org

• All national and international publications
• The complete micro-level database

Email: Andreas.Schleicher@OECD.org
Twitter: SchleicherEDU

Thank you!

and remember:
Without data, you are just another person with an opinion