The International Imperative: Why Should We Care So Much About Other Countries’ Education Systems?

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OECD
International comparisons matter:

To understand where you stand, how others are performing, and what strong performers are doing:

By sailing to different countries...

and looking at the world through...

PISA
Adult Skills Survey

TALIS
Etc.
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.
What do 15-year-olds know...
...and what can they do with what they know?

PISA 2012 results

Each year OECD countries spend 200bn$ on math education in school
High mathematics performance... Shanghai-China performs above this line (613)

Mean score

580
570
560
550
540
530
520
510
500
490
480
470
460
450
440
430
420
410

Low mathematics performance

Singapore
Hong Kong-China
Korea
Macao-China
Japan
Liechtenstein
Switzerland
Netherlands
Estonia
Finland
Canada
Poland
Belgium
Germany
Viet Nam
Austria
Australia
Ireland
Slovenia
Denmark
New Zealand
Czech Republic
France
United Kingdom
Iceland
Russia
Lithuania
Sweden
Croatia
Israel
Greece
Serbia
Turkey
Romania
Bulgaria
U.A.E.
Kazakhstan
Thailand
Chile
Malaysia
Mexico

Average performance of 15-year-olds in Mathematics

Fig I.2.13

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)
Test Questions (Level 2): Helen the Cyclist

Helen has just got a new bike. It has a speedometer which sits on the handlebar.

The speedometer can tell Helen the distance she travels and her average speed for a trip.

Question

On one trip, Helen rode 4 km in the first 10 minutes and then 2 km in the next 5 minutes.

Which one of the following statements is correct?

A. Helen's average speed was greater in the first 10 minutes than in the next 5 minutes.

B. Helen's average speed was the same in the first 10 minutes and in the next 5 minutes.

C. Helen's average speed was less in the first 10 minutes than in the next 5 minutes.

D. It is not possible to tell anything about Helen's average speed from the information given.
Percent of 15-year-olds who scored Level 2 or Above
Socially equitable distribution of learning opportunities

Strong socio-economic impact on student performance

Massachusetts

Connecticut

Florida
Don’t close achievement gaps the wrong way
Performance differences between top and bottom quarter of socio-economic distribution

PISA performance (mathematics)

Source: PISA 2012
Poverty isn’t destiny: PISA performance by decile of social background.

Source: PISA 2012
Variability in student mathematics performance between and within schools

Variation in student performance as % of OECD average variation

Performance differences between schools

Performance variation of students within schools

OECD average

Variation in student performance as % of OECD average variation
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.
Students' performance in problem solving is **higher** than their expected performance.

Students' performance in problem solving is **lower** than their expected performance.
Lessons from high performers

Catching up with the top performers

- High impact on outcomes
- High feasibility
  - Quick wins
- Low feasibility
  - Money pits
- Low impact on outcomes
  - Low hanging fruits
  - Must haves
- A commitment to education and the belief that competencies can be learned and therefore all children can achieve
  - Universal educational standards and personalization as the approach to heterogeneity in the student body...
  ... as opposed to a belief that students have different destinations to be met with different expectations, and selection/stratification as the approach to heterogeneity
  - Clear articulation who is responsible for ensuring student success and to whom
Countries where students have stronger beliefs in their abilities perform better in mathematics.

**Fig III.4.5**
Perceived self-responsibility for failure in mathematics

Percentage of students who reported "agree" or "strongly agree" with the following statements:

- Sometimes I am just unlucky
- The teacher did not get students interested in the material
- Sometimes the course material is too hard
- This week I made bad guesses on the quiz
- My teacher did not explain the concepts well this week
- I’m not very good at solving mathematics problems

Fig III.3.6
Lessons from high performers

- High impact on outcomes
- High feasibility
- Money pits
- Low feasibility
- Low impact on outcomes
- Quick wins
- Incentive structures and accountability

- Clear ambitious goals that are shared across the system and aligned with high stakes gateways and instructional systems
  - Well established delivery chain through which curricular goals translate into instructional systems, instructional practices and student learning (intended, implemented and achieved)
  - High level of metacognitive content of instruction ...
Capacity at the point of delivery

- Attracting, developing and retaining high quality teachers and school leaders and a work organisation in which they can use their potential
- Instructional leadership and human resource management in schools
- Keeping teaching an attractive profession
- System-wide career development ...
TALIS in Brief

Over 100 thousand randomly selected lower secondary teachers and their school leaders from over 6500 schools

...representing more than 4 million teachers in 34 countries...

...took an internationally-agreed survey about the working conditions and learning environments in their schools...

...responding to questions about their background, their teaching practices, support and development, their relationships with colleagues and students and the leadership in their schools
Developing Teaching as a profession

- Improve the societal view of teaching as a profession
- Recruit top candidates into the profession
- Developing Teaching as a profession
- Retain and recognise effective teachers – path for growth
- Support teachers in continued development of practice

Implementing highly effective teacher policy and practice
Teachers' perceptions of the value of teaching

Percentage of lower secondary teachers who "agree" or "strongly agree" that teaching profession is a valued profession in society

Above-average performers in PISA
Countries where teachers believe their profession is valued show higher levels of student achievement.

Relationship between lower secondary teachers' views on the value of their profession in society and the country's share of top mathematics performers in PISA 2012.

The graph shows a positive correlation between the percentage of teachers who agree that teaching is valued and the share of mathematics top performers. The equation $R^2 = 0.24$ and $r = 0.49$ indicates the strength of this relationship.
Teachers' needs for professional development

Percentage of lower secondary teachers indicating they have a high level of need for professional development in the following areas:

- Teaching students with special needs
- ICT skills for teaching
- New technologies in the workplace
- Student behaviour and classroom management
- Teaching in a multicultural or multilingual setting
- Approaches to individualised learning
- Student career guidance and counselling
- Student evaluation and assessment practice
- Teaching cross-curricular skills
- Developing competencies for future work
- Pedagogical competencies
- School management and administration
- Knowledge of the subject field(s)
- Knowledge of the curriculum
Test scores of teachers and graduates (numeracy)

Middle half of the numeracy skill distribution of graduates (16-65 years)
Test scores of teachers and graduates (numeracy)

<table>
<thead>
<tr>
<th>Country</th>
<th>PIAAC test scores (numeracy)</th>
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<tr>
<td>Japan</td>
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<td>Finland</td>
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<td>Flanders (Belgium)</td>
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<td>Slovak Republic</td>
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Middle half of the numeracy skill distribution of graduates (16-65 years)

Numeracy skills of teachers
Incentives, accountability, knowledge management

- Aligned incentive structures
  
  For students
  - How gateways affect the strength, direction, clarity and nature of the incentives operating on students at each stage of their education
  - Degree to which students have incentives to take tough courses and study hard
  - Opportunity costs for staying in school and performing well

  For teachers
  - Make innovations in pedagogy and/or organisation
  - Improve their own performance and the performance of their colleagues
  - Pursue professional development opportunities that lead to stronger pedagogical practices

- A balance between vertical and lateral accountability
- Effective instruments to manage and share knowledge and spread innovation – communication within the system and with stakeholders around it
- A capable centre with authority and legitimacy to act
Countries that grant schools autonomy over curricula and assessments tend to perform better in mathematics.

Source: PISA 2012
Quality assurance and school improvement

Percentage of students in schools whose principal reported that their schools have the following for quality assurance and improvement:

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

Fig IV.4.14

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Investing resources where they can make most of a difference

- Alignment of resources with key challenges (e.g., attracting the most talented teachers to the most challenging classrooms)
- Effective spending choices that prioritise high quality teachers over smaller classes
Countries with better performance in mathematics tend to allocate educational resources more equitably.

Adjusted by per capita GDP

Source: PISA 2012
Coherence of policies and practices

- Alignment of policies across all aspects of the system
- Coherence of policies over sustained periods of time
- Consistency of implementation
- Fidelity of implementation (without excessive control)
Innovating to create 21st-century learning environments

Lessons from high performers

• To gain the benefits of collaborative planning, work, and shared professional development strategies
• To open up pedagogical options
• To give extra attention to groups of learners

Regrouping educators

• To give learners a sense of belonging & engagement
• To mix students of different ages
• To mix abilities and strengths
• To widen pedagogical options, including peer teaching

Rescheduling learning

• Inquiry, authentic learning, collaboration, and formative assessment
• A prominent place for student voice & agency

• To allow for deeper learning
• To create flexibility for more individual choices
• To accelerate learning
• To use out-of-school learning in effective & innovative ways
Most teachers value 21st century pedagogies…

Percentage of lower secondary teachers who "agree" or "strongly agree" that:

- My role as a teacher is to facilitate students' own inquiry
- Students should be allowed to think of solutions to practical problems themselves before the teacher shows them how they are solved
- Thinking and reasoning processes are more important than specific curriculum content
- Students learn best by finding solutions to problems on their own
...but teaching practices do not always reflect that

Percentage of lower secondary teachers who report using the following teaching practices "frequently" or "in all or nearly all lessons"

- Present a summary of recently learned content
- Check students’ exercise books or homework
- Refer to a problem from everyday life or work to demonstrate why new knowledge is useful
- Let students practice similar tasks until teacher knows that every student has understood the subject matter
- Students work in small groups to come up with a joint solution to a problem or task
- Give different work to the students who have difficulties learning and/or to those who can advance faster
- Students use ICT for projects or class work
- Students work on projects that require at least one week to complete
Lessons from high performers

Changes in instructional practice – PISA 2006-9

Increase percentage correct

OECD
Japan

Multiple-choice - reproducing knowledge

OECD: 0.8
Japan: 1.7

Open-ended - constructing knowledge (21st century skills)

OECD: 1.7
Japan: 6.5
Some students learn at high levels

All students need to learn at high levels

Routine cognitive skills, rote learning

Learning to learn, complex ways of thinking, ways of working

Few years more than secondary

High-level professional knowledge workers

‘Tayloristic’, hierarchical

Flat, collegial

Primarily to authorities

Primarily to peers and stakeholders
Thank you

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