Raising excellence and equity in education

Best in Class 2018 – a global perspective

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Science performance and equity in PISA (2015)

Some countries combine excellence with equity
Poverty need not be destiny:
PISA math performance by decile of social background

Mathematics performance of the 10% most privileged American 15-year-olds (~Japan)

Mathematics performance of the 10% most disadvantaged American 15-year-olds (~Mexico)
Lessons from PISA

High impact on outcomes

Low feasibility
Low hanging fruits
Money pits

High feasibility
Quick wins
Must haves

Low impact on outcomes
Lessons from PISA

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

- High impact on outcomes
  - Quick wins
  - Resources where they yield most
  - Incentive structures and accountability

- Low feasibility
  - Capacity at point of delivery
  - Coherence

- High feasibility
  - Must haves
  - Commitment to universal achievement
  - Gateways, instructional systems

Looking outwards
Figure II.6.2

Spending per student from the age of 6 to 15 and science performance

Average spending per student from the age of 6 to 15 (in thousands USD, PPP)

Science performance (score points)

R² = 0.41

R² = 0.01
Disadvantaged schools often have more teachers…

Average class size in 9th grade, by quarter of school socio-economic profile (OECD average)

Students per class

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Average Class Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom quarter</td>
<td>24.2</td>
</tr>
<tr>
<td>Second quarter</td>
<td>25.8</td>
</tr>
<tr>
<td>Third quarter</td>
<td>27.0</td>
</tr>
<tr>
<td>Top quarter</td>
<td>27.7</td>
</tr>
</tbody>
</table>

Figure 3.1
…but teachers in disadvantaged schools are **less qualified**…

Science teachers with a university major in science, by school socio-economic profile (OECD Average)

![Bar chart showing percentage of science teachers with a university major in science, by school socio-economic profile.](image-url)
... and less experienced

Average teacher experience, by quarter of school socio-economic profile (Average-18)

Figure 3.7

Years of experience

- Bottom quarter: 15.6
- Second quarter: 16.7
- Third quarter: 16.6
- Top quarter: 16.7
...and principals report more often a lack of teachers

Principals' views on lack of teaching staff, by quarter of school socio-economic profile (OECD Average)

Figure 3.3

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom quarter</td>
<td>35.1</td>
</tr>
<tr>
<td>Second quarter</td>
<td>31.1</td>
</tr>
<tr>
<td>Third quarter</td>
<td>29.9</td>
</tr>
<tr>
<td>Top quarter</td>
<td>21.4</td>
</tr>
</tbody>
</table>
Differences in educational resources between advantaged and disadvantaged schools

Figure I.6.14

Disadvantaged schools have more resources than advantaged schools.

Disadvantaged schools have fewer resources than advantaged schools.
Does greater school autonomy go together with greater inequity?

Figure 3.16

- **No**: Where school responsibility for hiring/firing teachers and setting salaries is greater, inequitable teacher sorting appears LESS frequent!

**Percentage of students in schools whose principal or the school governing board has considerable responsibility for determining teachers' salary increases**

**Difference between advantaged and disadvantaged schools in the proportion of non-science teachers who reported that the school's capacity to provide instruction is hindered by a lack of teaching staff at least to some extent**

\[ R^2 = 0.39 \]
Square school choice with equity

Financial incentives for schools

Assistance for disadvantaged parents

Manage/consolidate school network

Formula-based approaches to school financing

Engaging parents and stakeholders

Foster collaboration/pairing among schools

Admission policies, controlled choice

What can policy do?
Attendance at pre-primary school by schools’ socio-economic profile

Table II.6.51

Number of years in pre-primary education among students attending socio-economically...

Disadvantaged schools

Advantaged schools

OECD average
Variation in performance between and within schools

Figure I.6.11

Between-school variation | Within-school variation
--------- | ---------

Total variation as a proportion of the OECD average

OECD average 30%

OECD average 69%

OECD average 69%

%
Teachers, teaching and learning
Learning time and science performance

Figure II.6.23

PISA science score vs. Total learning time in and outside of school

- Finland
- Germany
- Switzerland
- Japan
- Estonia
- New Zealand
- Macao (China)
- Hong Kong (China)
- Chinese Taipei
- Singapore
- Sweden
- Netherlands
- Poland
- United States
- Korea
- Russia
- Italy
- Indonesia
- Uruguay
- Bulgaria
- Greece
- China
- Chile
- Mexico
- Costa Rica
- Brazil
- Peru
- Qatar
- Thailand
- United Arab Emirates
- Tunisia

OECD average

R² = 0.21
Learning time and science performance (PISA)

- Intended learning time at school (hours)
- Study time after school (hours)
- Score points in science per hour of total learning time

Countries are ranked according to their score points in science per hour of total learning time. The graph shows the intended learning time at school, study time after school, and score points in science per hour of total learning time for various countries.

- Finland has the highest score points in science per hour of total learning time.
- United Arab Emirates has the lowest score points in science per hour of total learning time.

Score points in science per hour of learning time:

- Minimum: 0
- Maximum: 16

Countries are listed in alphabetical order by country name.
Teachers’ skills

Numeracy test scores of tertiary graduates and teachers

Numeracy skills of middle half of college graduates

Japan
Finland
Flanders (Belgium)
Germany
Norway
Netherlands
Austria
Czech Republic
Sweden
Australia
France
Northern Ireland (UK)
Denmark
England/N. Ireland (UK)
England (UK)
Korea
Ireland
Canada
United States
Estonia
Poland
Spain
Teachers’ skills

Numeracy test scores of tertiary graduates and teachers

Numeracy skills of teachers

Countries with high numeracy scores:
- Japan
- Finland
- Flanders (Belgium)
- Germany
- Norway
- Netherlands
- Austria
- Czech Republic
- Sweden
- Australia
- France
- Northern Ireland (UK)
- Denmark
- England/N. Ireland (UK)
- England (UK)
- Korea
- Ireland
- Canada
- United States
- Estonia
- Poland
- Spain
What teachers say and what teachers do
96% of teachers: My role as a teacher is to facilitate students own inquiry
86%: Students learn best by finding solutions on their own.
74%: Thinking and reasoning is more important than curriculum content
Prevalence of **memorisation**
rehearsal, routine exercises, drill and practice and/or repetition

Prevalence of **elaboration**
reasoning, deep learning, intrinsic motivation, critical thinking, creativity, non-routine problems
Memorisation is less useful as problems become more difficult (OECD average)

$$R^2 = 0.81$$

Source: Figure 4.3
Elaboration strategies are more useful as problems become more difficult (OECD average).

Source: Figure 6.2
Students in disadvantaged schools have less exposure **conceptual understanding** in math.

One-point difference in exposure to conceptual understanding predicts a 1.23 Std.Dev difference in school performance.

Source: Figure 7.1a
Growing expectations on teachers

Be experts on their discipline and experts on how students learn

Respond to individual differences with broad pedagogical repertoire

Provide continual assessment with formative feedback

Be demanding for every student with a high level of cognitive activation

Ensure that students feel valued and included and learning is collaborative

• Some evidence that well-being factors impact motivation, self-efficacy and job commitment

• Attrition a growing issue, with high costs

• Growing teacher shortages
Teachers’ job satisfaction

- Strongly agree
- Agree
- Disagree
- Strongly disagree

I am satisfied with my performance in this school
All in all, I am satisfied with my job
I enjoy working at this school
I would recommend my school as a good place to work
If I could decide again, I would still choose to work as a teacher
The advantages of being a teacher clearly outweigh the disadvantages
Teachers’ job satisfaction and class size

![Bar chart showing teachers' job satisfaction levels across different class sizes. The chart indicates higher job satisfaction in classes with fewer students (15 or less) compared to larger classes (36 or more).]
Teacher job satisfaction and professionalism

- Perceptions of teachers’ status
- Satisfaction with the profession
- Satisfaction with the work environment
- Teachers’ self-efficacy

Low professionalism
High professionalism
Professional collaboration among teachers

Percentage of lower secondary teachers who report doing the following activities at least once per month

- Discuss individual students
- Share resources
- Team conferences
- Collaborate for common standards

Exchange and co-ordination

Professional collaboration

- Team teaching
- Collaborative PD
- Joint activities
- Classroom observations

Average (OECD countries)
Teachers Self-Efficacy and Professional Collaboration

Teach jointly as a team in the same class
Observe other teachers' classes and provide feedback
Engage in joint activities across different classes
Take part in collaborative professional learning

Teacher self-efficacy (level)

Less frequently
More frequently

- Never
- Once a year or less
- 2-4 times a year
- 5-10 times a year
- 1-3 times a month
- Once a week or more
Student-teacher ratios and class size

Figure II.6.14

High student-teacher ratios and small class sizes

Low student-teacher ratios and large class sizes

OECD average

Student-teacher ratio

Class size in language of instruction

R² = 0.25
Professionalism

- Public confidence in profession and professionals
- Professional preparation and learning
- Collective ownership of professional practice
- Decisions made in accordance with the body of knowledge of the profession
- Acceptance of professional responsibility in the name of the profession and accountability towards the profession
One last thought

Research in education
Public educational research

Public expenditures in education and health as % of GDP (2014)

- Education: 5.5%
- Health: 6.5%

Share (%) of public research budget on education and health (2014)

- Education: 1.8%
- Health: 9.3%

OECD average
Public educational research: budget per student

Public budget for education per student (2014)
Thank you

Find out more about our work at www.oecd.org/edu

– All publications
– The complete PISA micro-level database

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