LOW-PERFORMING STUDENTS
WHY THEY FALL BEHIND AND
HOW TO HELP THEM SUCCEED

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“Low-Performing” Students: What do we mean?
Low performers: Definitions in PISA

• In PISA, **Level 2** is considered the **baseline level of proficiency** in mathematics, reading and/or science.

• In PISA, “**low performers**” are students who perform below the baseline Level 2 in mathematics, reading and/or science (i.e. they score at Level 1 or below).

• **Low performers** can answer questions that provide clear directions and single information sources and connections. However, they typically cannot make more complex uses of information and reasoning.

Students demonstrate elementary skills to read and understand simple text and master basic mathematical and scientific concepts and procedures.
# Proficiency levels in mathematics, reading and science

<table>
<thead>
<tr>
<th>At or above the baseline proficiency</th>
<th>Proficiency level</th>
<th>Lowest score point in the level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mathematics</td>
</tr>
<tr>
<td>Level 6</td>
<td>669</td>
<td>698</td>
</tr>
<tr>
<td>Level 5</td>
<td>607</td>
<td>626</td>
</tr>
<tr>
<td>Level 4</td>
<td>545</td>
<td>553</td>
</tr>
<tr>
<td>Level 3</td>
<td>482</td>
<td>480</td>
</tr>
<tr>
<td>Level 2 (baseline)</td>
<td><strong>420</strong></td>
<td><strong>407</strong></td>
</tr>
</tbody>
</table>

| Low-performing students (below baseline) | Low-performing students in mathematics score **below** 420 points | Low-performing students in reading score **below** 407 points | Low-performing students in science score **below** 410 points |
|-----------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|
| Below Level 1                           | .                                                             | .                                                             |

Low-performing students in mathematics are those who score below 420 points. Low-performing students in reading are those who score below 407 points. Low-performing students in science are those who score below 410 points.
Mei-Ling from Singapore was preparing to go to South Africa for 3 months as an exchange student. She needed to change her Singapore dollars (SGD) into South African rand (ZAR).

**Question:** Mei-Ling found out that the exchange rate between Singapore dollars and South African rand was:

1 SGD = 4.2 ZAR

Mei-Ling changed 3000 Singapore dollars at this exchange rate. How much money in South African rand did Mei-Ling get?

Answer: ________________________

Answering this question correctly corresponds to a difficulty of 406 score points on the PISA mathematics scale. Across countries, 80% of students answered correctly. To answer the question correctly students have to draw on skills from the reproduction competency cluster.
Low Performance at Age 15

Why it matters
Consequences for low performers

- Risk of dropping out of school: lower educational attainment
- Low-skills tend to be persistent over time, from age 15 into early adulthood
- Limited access to better-paying and more-rewarding jobs
- Poorer health and less civic participation
The economic value of eliminating low performance

Value of improvement in terms of current GDP over working life of today’s 15-year-olds

- Lower middle income countries
- Upper middle income countries
- High income non-OECD
- High income OECD

The **increase** in GDP among high income countries would still exceed total current spending on schooling.
Diversity of cases shows that reducing low performance is possible anywhere

Reduced their share of low performing students in...

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>OECD (6 countries)</strong></td>
<td><strong>OECD (6 countries)</strong></td>
<td><strong>OECD (12 countries)</strong></td>
</tr>
<tr>
<td>Germany</td>
<td>Germany</td>
<td>Estonia, Ireland</td>
</tr>
<tr>
<td>Mexico</td>
<td>Mexico</td>
<td>Israel, Italy</td>
</tr>
<tr>
<td>Italy</td>
<td>Italy</td>
<td><strong>Japan</strong></td>
</tr>
<tr>
<td>Poland</td>
<td>Poland</td>
<td>Poland, Portugal</td>
</tr>
<tr>
<td>Portugal</td>
<td>Turkey</td>
<td>Turkey, United States</td>
</tr>
<tr>
<td><strong>Partners (3 countries)</strong></td>
<td><strong>Partners (4 countries and economies)</strong></td>
<td><strong>Partners (8 countries and economies)</strong></td>
</tr>
<tr>
<td>Brazil</td>
<td><strong>Hong Kong-China</strong></td>
<td>Brazil, <strong>Hong Kong-China</strong></td>
</tr>
<tr>
<td>Russian Federation</td>
<td>Russian Federation</td>
<td>Latvia, Lithuania</td>
</tr>
<tr>
<td>Tunisia</td>
<td><strong>Thailand</strong></td>
<td>Qatar, Romania</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Thailand</strong>, Tunisia</td>
</tr>
</tbody>
</table>
Low-Performing Students: How many are there?
All countries participating in PISA have a sizable share of low performers

Percentage of low performers (Level 1 or below) in Mathematics

Source: Figure 1.5.
Overlap of low performance across subjects (OECD average)

- Not underperformer: 72%
- Low performers in at least 1 subject: 28%

Source: Figure 1.1.
STUDENTS’ BACKGROUND AND LOW PERFORMANCE
More likely to be low performer: socio-economically disadvantaged students

Odds ratios higher than 1.0 mean that disadvantaged students are more likely to be low performers than advantaged students.

Source: Figure 2.3.
Gender (OECD average)

Boys are more often low performers in reading and science.

Girls are more often low performers in mathematics.

Source: Figure 2.4.
The risk of low performance is cumulative and multidimensional

Source: Figure 2.19.

Cumulative probability of becoming a low performer

Prob. low performance (%)

0 10 20 30 40 50 60 70 80 90

Disadvantaged SES Girl Immigrant background Different language Lives in a rural area Single-parent A year or less of pre-primary Has no pre-primary Repeated a grade Vocational track

Socio-economic status

Demographic background

Progress through education
STUDENTS’ ATTITUDES AND BEHAVIORS AND LOW PERFORMANCE
Missing learning opportunities and low performance

Percentage of students who had skipped school at least once in the two weeks prior to the PISA test

- Low performers in mathematics
- Students scoring at or above the baseline in mathematics

Source: Figure 3.1.
Missing learning opportunities is associated with low performance in mathematics

Across OECD countries

Odds ratio: "at least once" versus "never"

- After accounting for students' characteristics
- Before accounting for students' characteristics

Students who had skipped some classes "at least once" are twice as likely to be low performers as students who had "never" skipped classes.

Source: Figure 3.2.
More hours spent doing homework is associated with a lower risk of low performance, at least up to a point.

After accounting for students' characteristics:
- Students who spend 6 hours on homework per week are 70% less likely to be low performers than students who do no homework.

Before accounting for students' characteristics:
- Odds ratio:

Source: Figure 3.4.
Low performers say they are less perseverant

Source: Figure 3.8.
Low performers in mathematics perceive their effort to be unproductive

Source: Figure 3.6.

- Low performers need support when preparing for exams and doing homework.

When questions relate to **invested effort:**
- differences are small
- differences are large

I work hard on my mathematics homework
I finish homework in time for mathematics class
I study hard for mathematics quizzes
I am prepared for mathematics exams

Source: Figure 3.6.
Participation in mathematics-related activities and low performance

- When activities require higher-order skills, **top performers** participate more.
- When activities are social and recreational, **low performers** participate more.

Source: Figure 3.5.
Low performers' attitudes towards school and learning, by school subject

Mean index

-1.0
-0.8
-0.6
-0.4
-0.2
0.0
0.2
0.4

Attendance at school
Perseverance
Sense of belonging at school
Mathematics self-efficacy

Early detection

Not a low performer
Low performer in one subject
Low performer in two subjects
Low performer in reading, mathematics and science

Source: Figure 3.19.
SCHOOLS
AND
LOW PERFORMANCE
Socio-economic inclusion in schools

Fewer low performers in countries with more social inclusion in schools

Source: Figure 5.1a.
Socio-economic inclusion in schools

More top performers in countries with more socio-economic inclusion in schools

Source: Figure 5.1b.
More likely to be low performers: students in schools where there is less teacher support.
School resources by country’s resources level

System-level correlation (all countries/economies in PISA 2012)

- Quality of physical infrastructure (below OECD average): $R^2 = 0.35$
- Quality of schools' educational resources (below OECD average): $R^2 = 0.42$
- Quality of schools' educational resources (above OECD average): $R^2 = 0.00$
- Quality of physical infrastructure (above OECD average): $R^2 = 0.00$

Source: Figure 5.3.
Equity in resource allocation and low performers, after accounting for the quality of schools' educational resources

- Equity in resource allocation and top performers, after accounting for the quality of schools' educational resources

Source: Figure 5.5.
School autonomy

System-level correlation (all countries/economies in PISA 2012)

- School responsibility for curriculum and assessment and **low performers**
  \[ R^2 = 0.13 \]

- School responsibility for curriculum and assessment and **top performers**
  \[ R^2 = 0.12 \]

- School responsibility for resource allocation and **low performers**
  \[ R^2 = 0.02 \]

- School responsibility for resource allocation and **top performers**
  \[ R^2 = 0.01 \]

Source: Figure 5.6.
Thanks!

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A POLICY FRAMEWORK FOR TACKLING STUDENT LOW PERFORMANCE
Summary: Risk Factors of Low Performance

Students

Socio-economic status

Socio-economic disadvantage

Girls (math), Boys (reading and science)

Immigrant, language minority, rural areas

Single parent family

Lack of pre-primary

Grade repetition

Vocational programme

Attitudes and behaviours

Missing classes

Low perseverance

Demographic background

Progress through education
Summary: Risk Factors of Low Performance

Schools

- School composition
  - Concentration of disadvantaged students
    - Low expectations for students
    - Unsupportive teachers, low teacher morale
    - More ability grouping
  - Lack of after-school opportunities
  - Uninvolved parents and communities
    - Lack of qualified teachers
    - Lack of quality educational resources

- Learning environment
Policies and practices to tackle low performance
POLICY MAKERS

Make it a priority to reduce low performance

Identify those who are the low performers

Step in as early as possible:

• Early education opportunities (e.g. pre-primary)
• Early diagnosis assessments and remedial support
Policies and practices to tackle low performance
POLICY MAKERS

Dismantle the multiple barriers to learning

• **Target special resources** for socio-economically disadvantaged and/or minority students

• **Psycho-social support** (e.g. psychologists, mentors, counsellors, assistance for families)

• Provide **extracurricular opportunities** in schools
Policies and practices to tackle low performance
SCHOOL LEADERS AND TEACHERS

Create supportive learning environments at school

• Set **high expectations** for all students
• Provide **special help** to students who need it most
• Take pride in your **school** and be **role models**
Encourage your child to make more of an effort in school
Help her/him with homework
Participate in school life
Make the most out of available education opportunities:

• Attend school regularly and arrive on time
• Do your homework
• Make your best effort at school
• Participate in extracurricular activities, both school-related and recreational