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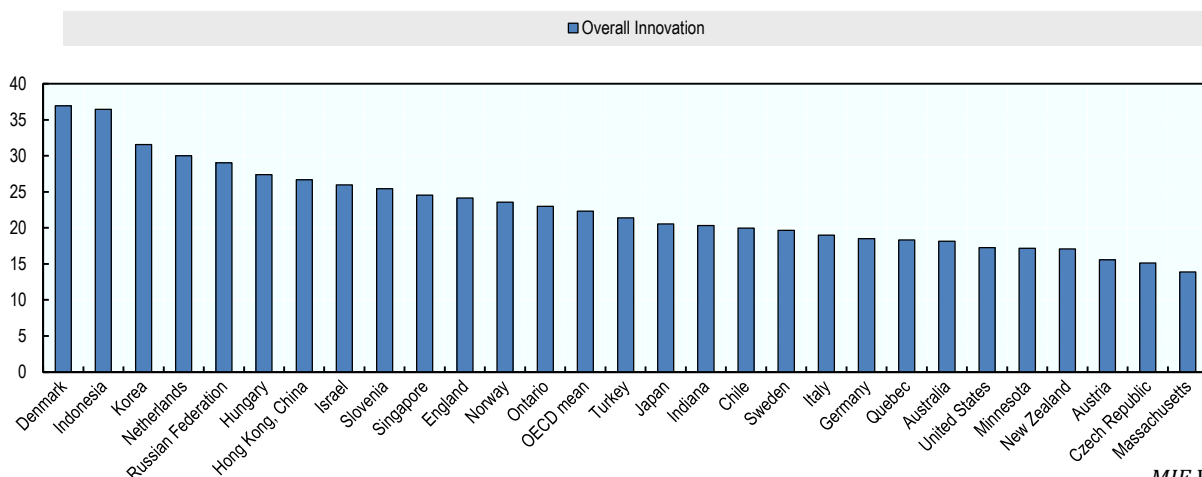
**The purpose of the *Measuring Innovation in Education* report**

The ability to measure innovation is essential to an improvement strategy in education. Knowing whether, and how much, practices are changing within classrooms and educational organisations, how teachers develop and use their pedagogical resources, and to what extent change can be linked to improvements would provide a substantial increase in the international education knowledge base.

The OECD *Measuring Innovation in Education* report offers new perspectives to address this need for measurement in educational innovation through a comparison of innovation in education to innovation in other sectors, identification of specific innovations across educational systems, and construction of metrics to examine the relationship between educational innovation and changes in educational outcomes. This country brief provides a short overview of the key findings of the report, as well as the top five Japanese pedagogic and organisational innovations identified by this report.

**Key findings on innovation in education – did you know?**

**Overall composite innovation index, 2000-2011**



MIE Figure 17.1

- In education, innovation can take place through either significant changes in the use of a particular educational practice or the emergence of new practices in an educational system.
- Contrary to common belief, there is a fair level of innovation in the education sector, both relative to other sectors and in absolute terms.
- Within education, innovation intensity is greatest in higher education, with secondary and primary education approximately equal.
- Compared to other sectors, knowledge and method innovation is above average in education, product and service innovation is below average, and technology innovation is at the average sectorial level.
- In Europe, higher education stands out in terms of speed of adopting innovation compared to the economy average as well as the rates in primary and secondary education.

- There have been large increases in innovative pedagogic practices across all countries studied for this report in areas such as relating lessons to real life, higher order skills, data and text interpretation and personalisation of teaching.
- In their pedagogic practice, educators have innovated in their use of assessments and in the accessibility and use of support resources for instruction.
- Educational organisations have innovated in the areas of special education, creation of professional learning communities for teachers, evaluation and analytics and relationship building with external stakeholders, such as parents.
- In general, countries with greater levels of innovation see increases in certain educational outcomes, including higher (and improving) 8<sup>th</sup> grade mathematics performance, more equitable learning outcomes across ability and more satisfied teachers.
- Innovative educational systems generally have higher expenditures than non-innovative systems; however, their students are no more satisfied than those in less innovative systems.

### Approach to measuring system innovations

While *Measuring Innovation in Education* identifies and analyses hundreds of innovations at the classroom and organisational levels, this brief identifies the top five Japanese innovations in pedagogic and organisational practices between 2003 and 2011. To determine each educational system's top five innovations in pedagogic and organisational practices, data from three international education datasets – Trends in International Mathematics and Science Study (TIMSS), Progress in International Reading Literacy Study (PIRLS), and the Programme on International Student Assessment (PISA) – were analysed to identify the areas in which each education system has demonstrated emerging or changing organisational and pedagogic practices over a specific period. For a full description of the data and methods used for analysis in this report, see report Annex A: Data Sources and Methods.

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#### Note regarding data from Israel

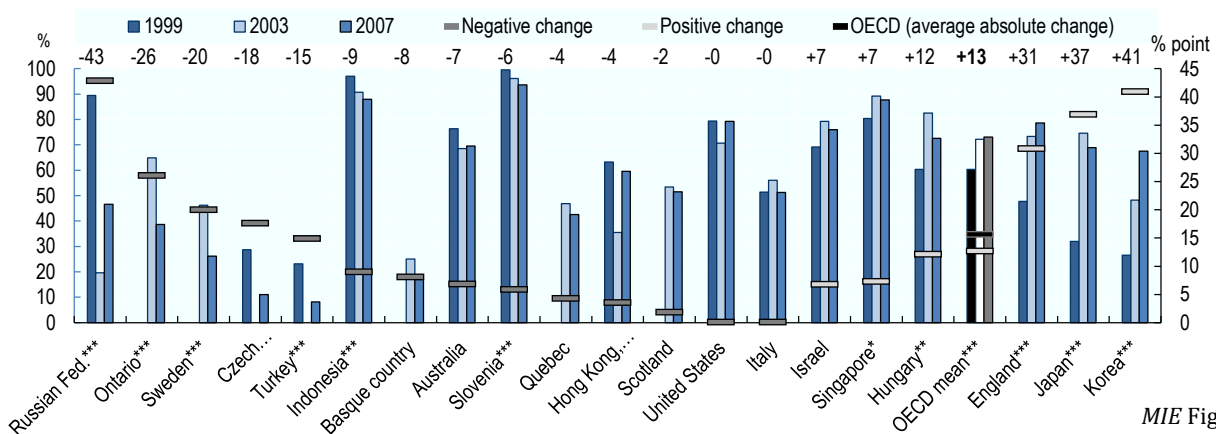
The statistical data for Israel are supplied by and are under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

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## Japan's top five innovations in organisational policy and practice:

### (1) More enrichment education in primary and secondary schools...

Percentage of 8<sup>th</sup> grade students in schools that offer enrichment mathematics and change over time



MIE Figure 12.6

Japan stands out as one of the two education systems studied in this report where innovation took the form of increased enrichment education provision in several education levels or disciplines simultaneously. In 8<sup>th</sup> grade, the percent of Japanese students enrolled in schools with enrichment mathematics and science education programs rose by 37% points and 30% points, respectively, from 1999 to 2007. The Japanese educational system also saw a gain from 2003 to 2007 in the percentage of 4<sup>th</sup> grade students enrolled in schools with mathematics and science enrichment, with changes of 26% points and 10% points, respectively, over this period.

### (2) More remedial education in secondary schools...

Japan also demonstrated innovation in the provision of remedial education at the secondary school level. Between 1999 and 2007, the percentage of Japanese 8<sup>th</sup> grade students in schools that offer remedial mathematics programs increased by 21% points, while the percentage of 8<sup>th</sup> grade students in schools offering remedial science education increased by 19% points.

### (3) More use of incentives for recruitment and retention of secondary teachers...

Another top organisational innovation in secondary schools in Japan is the changing use of incentive structures to recruit and retain quality teachers. In Japan, the percentage of 8<sup>th</sup> grade students in schools using incentives to recruit or retain mathematics teachers rose by 13% points between 2003 and 2011; similarly, the proportion of 8<sup>th</sup> grade students in schools using incentives to recruit or retain science teachers rose by 6% points over the same period.

### (4) More information provided to parents of secondary students...

Between 2006 and 2009, the percentage of 15-year old students in Japan in schools that provide information to parents on their child's academic performance relative to other students in the school rose by 20.2% points, from 39.8% of students to 60.0% of students. This increase was the largest in this metric of any educational system analysed for this report.

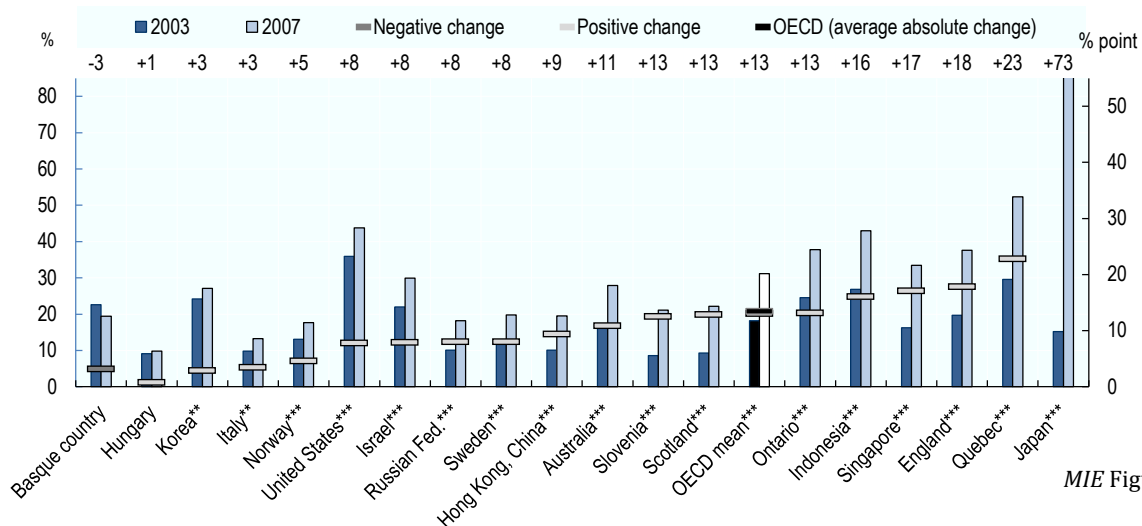
### (5) More use of assessments for national or district benchmarking...

Finally, Japan demonstrated innovation in education through changes in the use of student assessments for district or national benchmarking. Between 2000 and 2009, the percentage of Japanese 15-year olds in schools where assessments are used for comparing school to district or national performance increased by 14% points.

## Japan's top five innovations in pedagogic practice:

### (1) More group work in secondary mathematics classrooms...

Percentage of 8<sup>th</sup> grade math students working together in small groups in at least half their lessons and change over time



MIE Figure 7.1

Japan's top pedagogic innovation is the practice of using group work as a classroom activity in secondary mathematics classrooms. Between 2003 and 2007, Japan saw a 73% point increase in the percentage of students working together in small groups in 8<sup>th</sup> grade mathematics lessons according to student reports. In contrast, the OECD average change in this metric over the same period was 13% points.

### (2) More use of answer explanation in secondary mathematics...

Between 2003 and 2007, 8<sup>th</sup> grade students in Japan self-reported a 44% point increase in the proportion of students whose teachers ask them to explain their answers in their mathematics lessons, representing the largest increase in this metric of any educational system analysed in this report. Over the same period, Japanese teachers reported only an 8% point increase in this metric.

### (3) More relating of secondary mathematics lessons to everyday life...

Between 2003 and 2011, the percentage of 8<sup>th</sup> grade mathematics students whose teachers ask them to relate what they learn in class to their daily life increased by 12% points according to Japanese teachers. Between 2003 and 2007, Japanese students reported an even larger 19% point increase in this metric.

### (4) More data interpretation in secondary mathematics lessons...

Japan also saw innovation in the pedagogic practice of requiring students to perform data interpretation in secondary mathematics lessons. Between 2003 and 2007, the percentage of 8<sup>th</sup> grade mathematics students in Japan reporting that they interpret data in tables, figures or graphs increased by 18% points, the largest positive change of any educational system analysed in this report.

### (5) More use of explanation in primary and secondary science lessons...

Finally, teachers in Japan reported significant increases in the extent to which students explain what they are studying during primary and secondary science lessons. Between 2007 and 2011, the percentage of 8<sup>th</sup> grade students whose science teachers ask them to explain what they are studying in at least half their lessons rose from 28.8% to 45.5%; for 4<sup>th</sup> grade science, this value over the same period rose from 61.5% to 77.8%.