

5. Human capital

Human capital is instrumental for the development and sustainability of the space sector. The sector is home to highly skilled professionals, mainly technicians, scientists and engineers. The global space sector employs at least 900 000 persons around the world in 2013, including public administrations with responsibilities for managing space activities and publicly-funded research and development programmes (space agencies, space departments in civil and defence-related organisations), the core space manufacturing industry (building rockets, satellites, ground systems), direct suppliers to this industry and the wider space services sector (mainly commercial satellite telecommunications). Not included in this estimate are other major actors, which play a direct or indirect role in space programmes (e.g. universities, military personnel working on classified programmes). To give orders of magnitude, around 350 000 full-time employees are active in the United States, 200 000 in the Russian Federation, around 60 000 in Europe. A focus on the essential but narrower space manufacturing industry is provided in other indicators (see 6. *Space manufacturing activities*).

When examining human capital, it is important to consider the next generation of employees, who may get involved in space programmes. The majority of jobs available in the space sector can be found in the scientific and engineering fields. The OECD Programme for International Student Assessment (PISA) evaluates the quality, equity and efficiency of school systems by tracking the evolution of student performance over time and across subjects. Based on recent surveys, space remains overall an attractive sector for young students. When asked to choose a field of research which 15-year-old students would pursue as a scientist, most students chose the treatment and cure of diseases, or space science. The first one is much more popular with girls than boys but the difference is much narrower in the case of space. The two most common reasons for cited field of research involve references to curiosity, interest, excitement, and to helping people. Other OECD PISA results show differences between countries in the knowledge and

skills of 15-year-olds in mathematics, reading and science. On average across OECD countries, science performance has remained broadly stable since 2006. Students from China, Japan and Finland outperform all other countries and economies in science in PISA 2012: Shanghai-China (580 points), Hong Kong-China (555 points), Singapore (551 points), Japan (547 points) and Finland (545 points). Other countries with mean performances above the average include Estonia, Korea, Viet-Nam, Poland, Canada, Liechtenstein, Germany, Chinese Taipei, the Netherlands, Ireland, Australia, Macao-China, New Zealand, Switzerland, Slovenia, the United Kingdom and the Czech Republic. Countries that performed around the average include Austria, Belgium, Latvia, France, Denmark and the United States.

Methodological note

Existing data on space-related human capital are very fragmented. Official employment statistics on the sector are often poor, lacking in both quality and detail. To some extent, the gaps can be filled by micro-data coming mainly from industry associations' surveys, which usually focus on the space manufacturing industry while the larger services sector is not included.

Sources

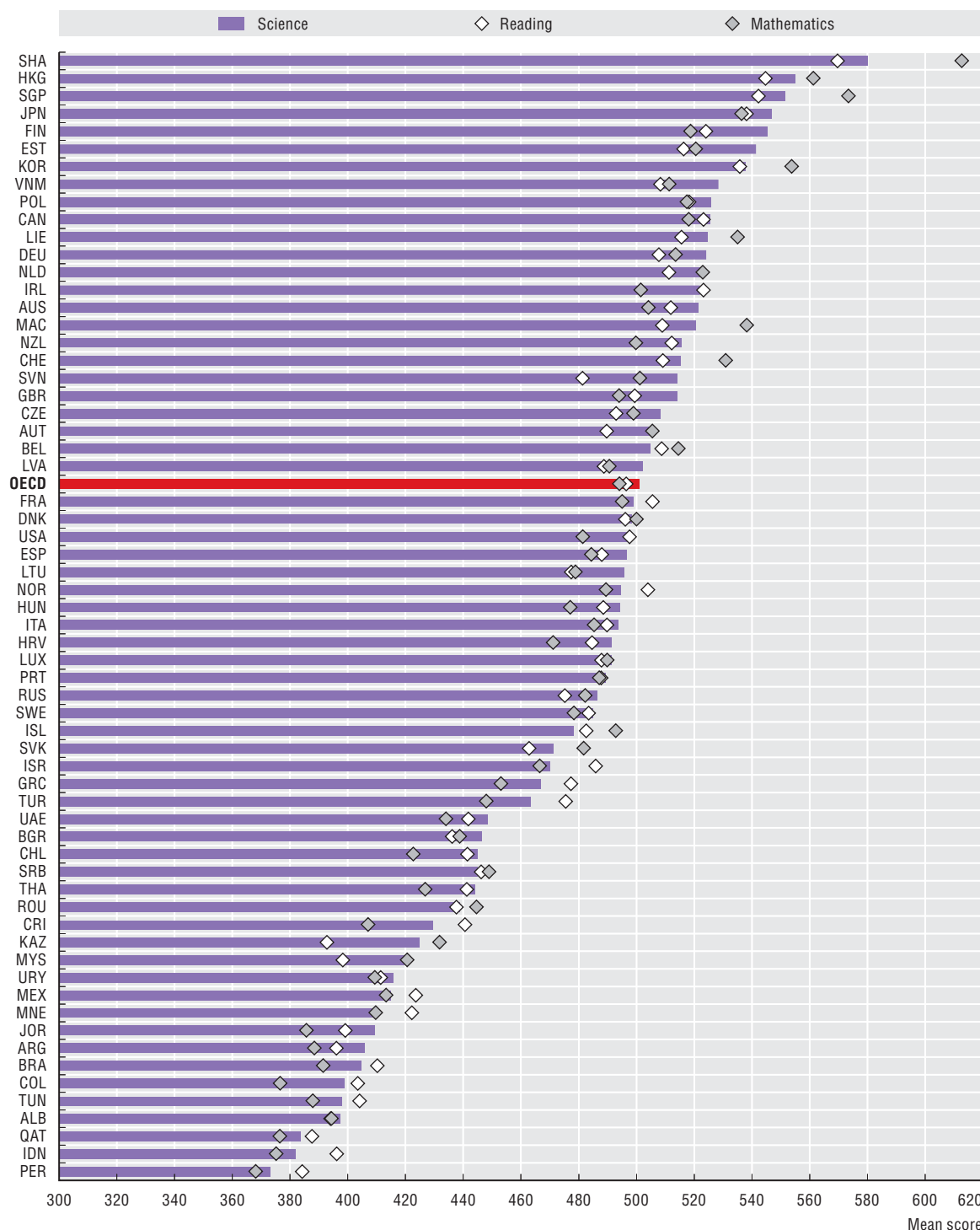
OECD (2014), *PISA 2012 Results: What Students Know and Can Do – Student Performance in Mathematics, Reading and Science* (Volume I, Revised edition, February 2014), PISA, OECD Publishing, dx.doi.org/10.1787/9789264201118-en.

Note

Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>.

5.1. The next generation of scientists: science, reading and mathematics proficiency at age 15

Mean score from OECD PISA test, 2012

Source: OECD PISA 2012 Results, 2014, <http://dx.doi.org/10.1787/9789264201118-en>.StatLink <http://dx.doi.org/10.1787/888933141779>



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