OECD

PISA IN FOCUS 37

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Do students have the drive to succeed?

- When students believe that investing effort in learning will make a difference, they score significantly higher in mathematics.
- The fact that large proportions of students in most countries consistently believe that student achievement is mainly a product of hard work, rather than inherited intelligence, suggests that education and its social context can make a difference in instilling values that foster success in education.
- Teachers' use of cognitive-activation strategies, such as giving students problems that require them to think for an extended time, presenting problems for which there is no immediately obvious way of arriving at a solution, and helping students to learn from their mistakes, is associated with students' drive.
- Students whose teachers set clear goals for learning and offer feedback on their performance in mathematics also tend to report higher levels of perseverance and openness to problem solving.

Raw potential and talent are only a small part of what it takes to become proficient in a skill. Students' success depends on the material and intangible resources that are invested by families, schools and education systems to develop each and every student's potential. Crucially, students' ability to perform at high levels depends on their belief that while aptitude and talent for particular school subjects can help, mastery can be achieved only if students put in the hard work and perseverance that are needed. In many cases, students with less raw potential, but with greater stamina, perseverance and capacity for hard work are more likely to succeed than those who are talented but have little capacity to set ambitious goals for themselves and keep focused on achieving them.

Students' drive and motivation to learn are not immutable; they can be nurtured.

PISA 2012 asked students about their stamina, capacity for hard work and perception that success or failure depends on their behaviour. Based on students' self-reports, PISA results show that drive and motivation are essential if students are to fulfil their potential; but that too many students lack the levels of perseverance, drive and motivation that would allow them to flourish in and out of school. For example, across OECD countries, only about two in three students reported that they do not tend to "put off difficult problems", about one in two reported that they tend to "remain interested in the tasks that they start", and only one in three reported that they "like to solve complex problems".

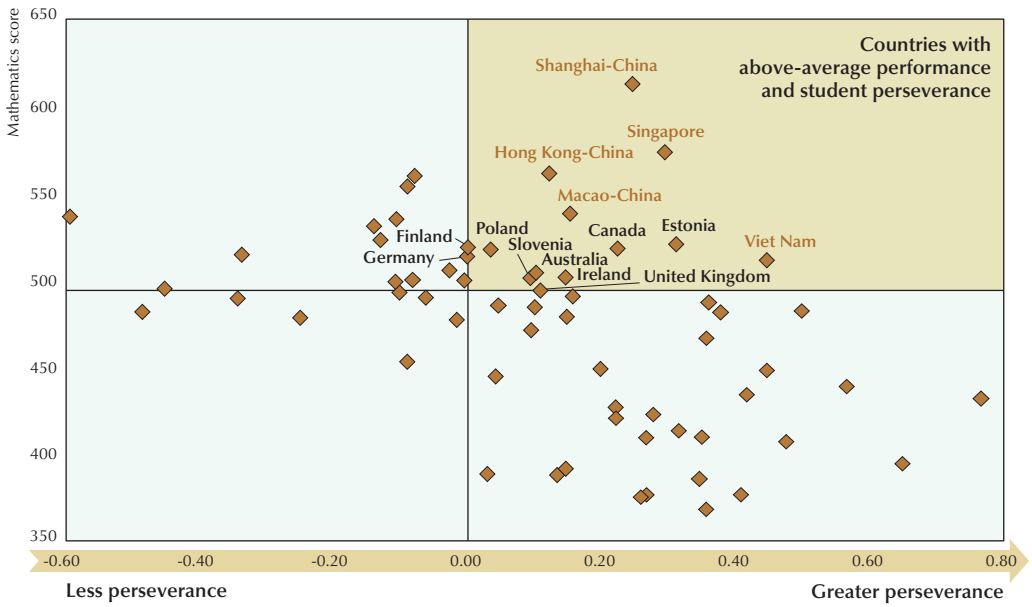
Percentage of students across OECD countries who reported that the following statements describe someone "very much like me" or "mostly like me" (a) or "not much like me" or "not at all like me" (b)

Source: OECD, PISA 2012 Database, Table III.3.1a.

StatLink http://dx.doi.org/10.1787/888932963939

PISA results also reveal that teachers' practices can promote students' drive and willingness to engage with complex problems. Teachers' use of cognitive-activation strategies, such as giving students problems that require them to think for an extended time, presenting problems for which there is no immediately obvious way of arriving at a solution, and helping students to learn from their mistakes, is associated with students' drive. Similarly, students who reported that their mathematics teachers use teacher-directed instruction (such as when teachers set clear goals for learning) and formative assessments (when teachers give students feedback on their strengths and weaknesses in mathematics) also reported particularly high levels of perseverance and openness to problem solving. Yet, the use of such strategies among teachers is not widespread: only 53% of students across OECD countries reported that their teachers often present them with problems that require them to think for an extended time, and 47% reported that their teachers often present problems for which there is no immediately obvious way of arriving at a solution. On average across OECD countries, only 17% of students reported that their teacher assigns projects that require at least one week to complete.

Performance in mathematics and student perseverance



Source: OECD, PISA 2012 Database, Tables I.2.3a and III.3.1d.

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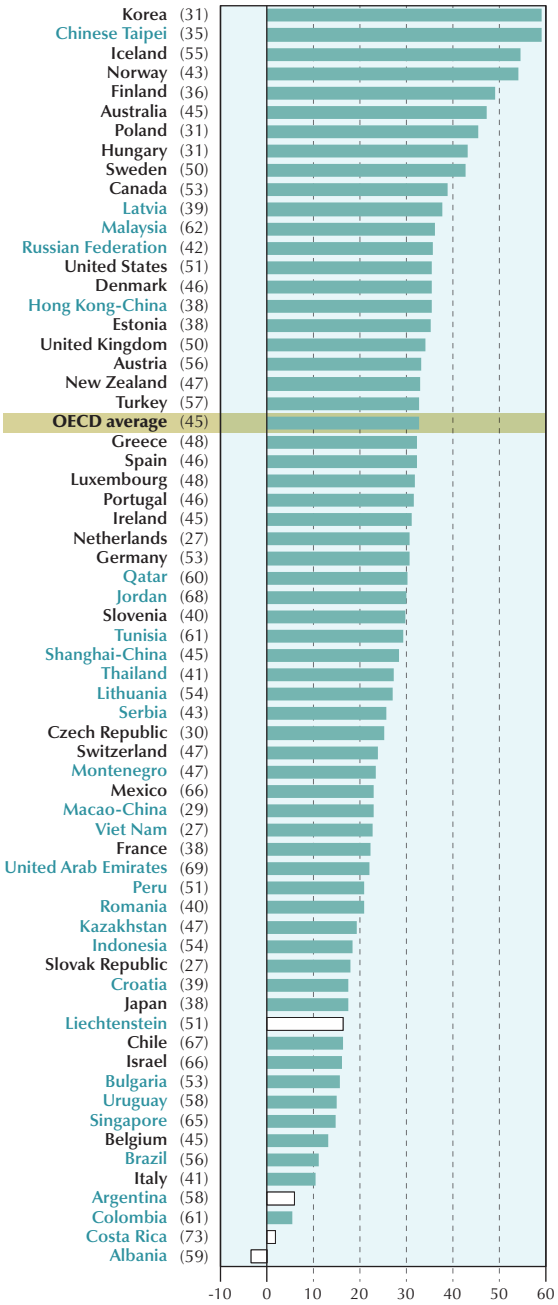
Perseverance tends to pay off…

Across OECD countries, 56% of students reported that they do not give up easily when confronted with a problem, 49% indicated that they remain interested in the tasks that they start, and 44% said that they continue working on tasks until everything is perfect. However, the OECD average masks significant differences across countries and economies. For example, at least 70% of students in Kazakhstan, Poland and the Russian Federation reported that they do not give up easily when confronting problems; and in Albania, Jordan, Kazakhstan and the United Arab Emirates, the same proportion of students reported that they continue to work on tasks until everything is perfect. In Belgium, the Czech Republic, France, Japan and Chinese Taipei, however, fewer than one in three students reported that they continue to work on tasks until everything is perfect.

Students who reported that they continue to work on tasks until everything is perfect, remain interested in the tasks they start, do not give up easily when confronted with a problem, and, when confronted with a problem, do more than is expected of them, have higher scores in mathematics than students who reported lower levels of perseverance. In as many as 25 countries and economies, students who have greater perseverance score at least 20 points higher in mathematics than students who reported lower levels of perseverance; and in Finland, Iceland, Korea, New Zealand, Norway and Chinese Taipei, this difference is larger than 30 score points.

Students' belief that success is earned through hard work is associated with better mathematics performance

Percentage of students who believe they can succed if they invest enough effort shown in parenthesis next to country name



Differences that are statistically significant at the 5% level ($p < 0.05$) are marked in a darker tone.

Countries and economies are ranked in descending order of the average score-point difference in mathematics that is associated with students strongly agreeing that they can succeed in mathematics if they put in enough effort.

Source: OECD, PISA 2012 Database, Table III.3.1d.

StatLink http://dx.doi.org/10.1787/888932963939

…as does the belief that success depends on how much effort is invested.

Students participating in PISA were also asked to report the extent to which they believe that they can succeed in mathematics if they put in enough effort. Students who agreed with the statement "If I put in enough effort, I can succeed in mathematics" perform better in mathematics than students who did not agree by an average of 32 score points. The score-point difference in mathematics performance that is associated with this self-belief is 50 points or more in Iceland, Korea, Norway and Chinese Taipei – well over the equivalent of a full school year.

The relationship between students' perceived control over their success in mathematics and their performance in mathematics appears to be particularly strong among the highest-achieving students. Among the highest-achieving students in OECD countries, those who strongly agreed that they can succeed in mathematics if they put in enough effort have a performance advantage of 36 score points over students who did not agree with that statement; among the lowest-achieving students, the difference is only 24 score points. In 24 countries and economies, this difference is 15 score points or more, and it is particularly large – 30 score points or more – in Hungary, the Slovak Republic, Sweden and Turkey.

The bottom line: Practice and hard work go a long way towards developing each student's potential; but students can only achieve at the highest levels when they believe that they are in control of their success and that they are capable of achieving at high levels. The fact that large proportions of students in most countries consistently believe that student achievement is mainly a product of hard work, rather than inherited intelligence, suggests that education and its social context can make a difference in instilling values that foster success in education.

For more information

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See *PISA 2012 Results, Ready to Learn: Students' Engagement, Drive and Self-Beliefs* (Volume III), OECD Publishing, Paris.

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