



5

Conclusions and Policy Implications



INTRODUCTION

Education can improve the quality of life of individuals and societies. Ensuring that all children achieve their full potential academically is a major policy goal for countries worldwide both for equity and efficiency reasons. Education can in fact play a major role in promoting social mobility and ensuring that children's future is not determined by the socio-economic background of their parents. At the same time, ensuring that all students perform at high levels is an important component of policies aimed at promoting economic growth and success in a world that demands well-educated citizens and workers.

This report examines factors that are associated with the academic achievement of disadvantaged students. By doing so it helps educators and policy makers to promote the full realisation of the human potential of youth. Schools and countries seeking to promote the skills and knowledge of their most vulnerable and disadvantaged children have in fact so far relied mostly on country-specific evidence on how young people's socio-economic background is associated with poor achievement in school. However far less is known about the circumstances in which disadvantaged students can flourish and express their full potential. Consequently the report focuses on a group of students that "beat the odds" in the sense that they defy expectations and excel academically despite having a socio-economic background that in general is associated with poor outcomes at school. The goal is to infer what could be done to help more disadvantaged students "beat the odds".

The report defines students who "beat the odds" as resilient and uses data from the 2006 PISA science assessment to identify such students in different countries. In other words, a resilient student is a high-achieving socio-economically disadvantaged student. Resilient students are among the most disadvantaged third in their countries in terms of socio-economic background and among the third of students in their country with the highest scores in the PISA science assessment. The report examines three sets of factors – approaches to learning, participation in science courses and time spent learning science at school, and school characteristics – which may help explain the success in PISA science of this group of students.

The report maps resilience and the factors associated with students' ability to "beat the odds" in 55 countries using data from the 2006 PISA study. It represents the most extensive and rigorous treatment to date of academic resilience across countries. Because of the focus on science in the 2006 PISA study, the report uses performance in science as the measure of student achievement. By exploring which circumstances are associated with academic resilience, the report provides new insights into how educators, school administrators, policy makers and parents can better support disadvantaged students and help them to succeed in school.

This report provides a rich descriptive picture of resilience across a large number of countries. It shows that in all countries, disadvantaged students have the potential to overcome their economic and social disadvantage and to perform at levels similar to their more advantaged peers. The findings also confirm that disadvantaged students have the potential to become the leaders of the future and that socio-economic disadvantage can be overcome with the right set of circumstances and incentives. While the data do not allow causal inference, the results highlight key differences between students who beat the odds and those who do not. Most notably, resilient students generally have more positive learning approaches and spend more time in regular lessons at school than other disadvantaged students. These findings suggest that conditions that promote academic excellence among the most disadvantaged youngsters can be established.

This chapter reviews the report's main findings and discusses their implications for educational policy and practice. Two themes emerge from these findings and they are discussed in turn in the next section. Taken together these themes suggest several policy areas to which countries and schools may want to direct their efforts to increase school success and facilitate social mobility among their most disadvantaged citizens.



There are important areas of educational policy where this report is silent simply because they are not well covered in PISA. The report ends with a brief review of areas where PISA could look in the future to provide further policy insights for analysing resilience in student performance.

FINDINGS AND IMPLICATIONS FOR EDUCATIONAL POLICY AND PRACTICE

The majority of resilient students, especially in OECD countries, achieve scores in the PISA science assessment that place them in the top three PISA proficiency levels. In contrast, the great majority of disadvantaged low-achieving students perform below the baseline proficiency level. Disadvantaged low-achieving students are at a high risk of completing their studies without those skills and competencies that are essential to fully participate in society and succeed in the labour market.

The report identifies two factors that appear to be particularly strongly associated with successful academic performance among disadvantaged students: the extent to which disadvantaged students adopt positive approaches to learning and the amount of time they spend in regular science lessons.

First, disadvantaged students who exhibit more positive approaches to learning science are more likely to be resilient than other disadvantaged students. Resilient students are more motivated to learn to science, more engaged with science and have greater self-confidence in their ability to learn science. The level of self-confidence in their academic abilities is in fact one of the strongest correlates of resilience.

Policies aimed at fostering positive approaches to learning among disadvantaged students could help facilitate resilience. Programmes designed to increase disadvantaged students' confidence in their academic abilities may be a good place to start. Increased self-confidence may be achieved through instructional techniques that challenge false perceptions of inability. Programs that encourage students to engage and explore science topics may also help. Other research suggests that facilitating interactions between disadvantaged students and individuals who work in scientific industries may also help disadvantaged students believe they can do well in science. High quality mentoring programmes have been shown to be beneficial particularly to disadvantaged students (DuBois *et al.*, 2004).

Second, the amount of time spent learning science during regular school hours is significantly associated with resilience in almost all participating countries. Students who spend more hours in regular science lessons at school have significantly higher odds of being resilient than students who spend less time in science lessons. Furthermore, it appears that while all students benefit from attending compulsory science courses, in several countries disadvantaged students benefit more than more advantaged students from attending compulsory courses.

School science classrooms are the primary venue in which students can acquire science skills and knowledge. Yet this report's findings show that many disadvantaged students do not take any science courses. If science is important to success later in life and the betterment of society, then students need to be exposed to science in school. Increasing science course-taking requirements and expanding the science curricula could enable more disadvantaged students to achieve at the highest levels. Changes to school course-taking policies may therefore be effective policy tools to help foster academic resilience: time spent learning is strongly associated with skill development and conceptual understanding (Clark and Linn, 2003) and with the likelihood that students will be exposed to academic material they otherwise might not have been able to consult (Schiller and Muller, 2003; Teitlebaum, 2003). A note of caution is warranted, however, as increased course-taking requirements can also lead to higher failure rates (Gamoran and Hannigan, 2000) if teachers do not adequately adapt their classroom instructional techniques to reflect students' prior preparation and learning styles.

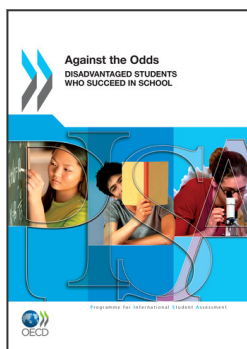


The PISA study does not provide all the information that is relevant to student resilience. For example, it does not provide information about particular programmes or policies that may contribute to resilience or to the correlates of resilience (*i.e.* student confidence). The following paragraphs therefore explore other research studies to provide additional information about policies and programs that have shown promise in targeting those aspects of disadvantaged students' approaches to learning and educational experiences that may help facilitate and expand their resilience.

Teachers are an important, if not the most important, factor in improving student performance (Aronson *et al.*, 2007; Hanushek, 1986). Policies and programmes designed to enhance and expand teachers' use of effective instructional techniques may prove useful to promoting resilience. A meta-analytic review of a decade's worth of teacher effectiveness literature offers some guidance to countries and schools. The review identifies the following strategies as having the strongest positive effects on "motivational-affective outcomes" (*i.e.* on those outcomes most similar to the student approaches to learning factors measured in PISA): subject domain-specific activities for processing information (e.g. mathematics problem solving, science inquiry), social experiences (e.g. cooperative learning, student discussion), time for learning, and regulation and monitoring (e.g. providing feedback and support, teaching students strategies of self-regulation and monitoring) (Seidel and Shavelson, 2007). Encouraging teachers to use these instructional strategies could help to improve students' motivation and confidence and, by extension, student resilience.

Finally, disadvantaged students may need better than average experiences to be able to perform at high levels and overcome their difficulties. If schools are going to be a catalyst for social mobility they may need to provide disadvantaged students with higher quality experiences and work hard to improve the students' motivation and confidence. The conversations and activities more advantaged students expose them to may make it clear why science matters, how science relates to their lives, and what they need to do to be successful in science-related career fields. Disadvantaged students' families may not be equipped to provide this information and exposure. Therefore, the schools these students attend could seek to provide these additional services to disadvantaged students to help them achieve at high levels.

The depth and pervasiveness of the current economic crisis has increased the number of youngsters that will face economic hardship in the coming years. The expectation of growing economic inequality and increases in poverty rates means that policy makers should renew their efforts to promote the academic achievement of all youngsters, with a special emphasis on the challenges disadvantaged students face. Failing to ensure that all youngsters have the opportunity to achieve their full potential at this critical stage could seriously challenge countries' chances of solid economic growth in the future and establish a cycle of underachievement and deprivation that will persist in the decades to come.



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