

Small class sizes not better for pupils' grades or resilience, says study

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Smaller class sizes in schools are failing to increase the resilience of children from low-income families, according to a study [published](#) in the *International Journal of Science Education*.

Data on more than 2,700 disadvantaged secondary (high) school students shows that minimizing pupil numbers in classrooms does not lead to better grades. Reducing class sizes could even decrease the odds of children achieving the best results, say the study authors.

The quantity of teachers also does not increase the odds of pupils from the poorest backgrounds achieving academically, despite concerns over staff shortages in schools. Instead, the researchers say that [resilience](#) is guaranteed by the quality of teachers such as those with high discipline standards and who use their expertise to improve learning.

The study authors, who looked at data from China and Japan, are now urging policymakers to invest more in high-quality teachers and not waste resources on cutting down the number of children in each class.

"This study supports the view that the quality of teachers, rather than the quantity, is the primary guarantee of students' resilience," says lead author Professor Tao Jiang, of Taizhou University whose research team also included experts from his institution and other China-based universities Northwest Normal, and Southwest.

"Quality teachers who effectively used teaching methods and managed classroom discipline increased the odds that individuals became resilient students. On the other hand, emphasizing the reduction of class sizes in schools may not benefit resilience. Smaller classes either had no relevance to resilience or were disadvantageous for resilience.

"Excessive emphasis on reducing class sizes is unnecessary, as it is detrimental to the emergence of students with high levels of resilience. Instead of allocating [financial resources](#) to reduce class sizes, it would be more effective to invest in providing high-quality science teachers."

Academic resilience is defined as an individual's ability to resist

adversity and do well in school. It's not fixed, and therefore can be improved, and is linked to what happens in schools and classrooms.

The authors of this study set out to identify the qualities and characteristics of 1,594 disadvantaged science students in Japan and 1,114 in the Macau region of China. Ages ranged from 15 to 16 years approximately and class size from 15 pupils (or fewer) to more than 50.

The participants were grouped into low, medium, or high-level resilience. The researchers looked at which classroom factors, school resources and school culture increased the odds of being in the high-level group.

All students in the study had participated in the 2015 Programme of International Student Assessment (PISA), an international questionnaire-based survey. PISA measures a pupil's ability to use their reading, mathematics, and science knowledge.

Teacher discipline and support levels were among the many issues assessed by PISA. Pupils were also scored on motivation and how anxious they became during exams. Results showed overall that a third of students displayed high-level resilience, a quarter low, and the rest medium.

High-resilience students were very positive towards school, science, and their future careers. They also dedicated more time to learning science than others but did experience anxiety about exams.

Science teachers and their [teaching methods](#) "play a crucial role" in building students' resilience, according to the authors. The findings show that these students benefited from classroom discipline, teacher-directed instruction, inquiry-based teaching, and teacher support.

In Japan, the most robust predictor of high-level resilience was inquiry-based teaching, while in Macau, it was teacher-directed instruction.

As for the impact of class size, smaller classes either had no impact on resilience such as in Macau or had a negative effect as in Japan. Conversely, an increase in class size by just one rank raised the odds of disadvantaged pupils in Japan attaining the best rather than the lowest grades by 1.2 times.

Other findings from the study show that misbehavior in the classroom or school in general undermines resilience.

The messages from the study for teachers include the need to guide pupils to conform to rules, to maintain discipline, and prepare lessons in line with the needs of students.

The study did not analyze changes in how classrooms are managed now compared with before the pandemic. On this basis, the authors suggest that further studies are needed on how COVID-19 has affected teaching in the context of student resilience.

More information: Typologies of secondary school student academic resilience in science with classroom and school context predictors, *International Journal of Science Education* (2024). DOI: [10.1080/09500693.2024.2321471](https://doi.org/10.1080/09500693.2024.2321471)

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