
NEWSLETTER

How do Class Size and Teacher's Academic Qualifications Affect Students' Academic Performance? An International Comparative study based on PISA 2018 Results

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THE study, published in *Tsinghua Journal of Education*, uses PISA2018 results of 15-year-old middle school students from four provincial administrative regions in China (Beijing, Shanghai, Jiangsu, and Guangdong) , and other OECD countries as analysis sample to explore the differences in the distribution characteristics of class size and teacher academic qualifications between the four regions of China and OECD countries, and the impact of class size, teacher academic qualifications and their interaction terms on student academic performance. Multi-level linearity Model is adopted in the analysis. The results of the study are as follows.

- There are remarkable differences in the distribution characteristics of class sizes and teacher academic qualifications in middle schools between China and OECD countries. Class size in China is relatively larger than that of OECD countries. In terms of teacher education qualifications, the proportion of teachers with a master's degree in OECD countries is higher than China. In terms of the distribution of teacher academic qualifications corresponding to different class sizes, the distribution curve of class sizes and teachers' academic qualifications in OECD countries follows the rule of large classes with low teacher academic qualifications and small classes with high teacher academic qualifications, while the distribution curve in the four regions in China presents irregular wave patterns.
- Reducing class size and upgrading teacher academic qualifications will help improve student performance. When the class size of the four regions in China is reduced from more than 50 students to 41-45 students and 46-50 students, the improvement in student academic performance is significant; When the class size in OECD countries is reduced from more than 50 students to 16-20 students, or 26-30 students, or 31-35 students, students can improve their performance effectively. In terms of the impact of teachers' academic

qualifications on student performance, every 10% increase in the proportion of the master's degree in the faculty will result in an average increase of 10.2 points in mathematics scores for students in the four regions of China, and an average increase of 5.6 points for students in OECD countries.

- A quadratic test of class size in OECD countries indicates that class size has a non-linear relationship with the improvement of student academic performance, and the best marginal benefit range for measuring the impact of class size on student performance is 21-30 students per class.
- The interaction between class size and teacher academic qualifications is tested, and it is found that class size and teacher academic qualifications have a “mutually independent” effect on student academic performance in China, while in OECD countries, they have a “mutually substituting” effect on student academic performance. Both have their own specific role thresholds.

The research results indicate that the benefits of reducing class size and upgrading teachers' academic qualifications are not only reflected in student performance improvement, but also in the development of students' non-cognitive abilities. Reducing class size helps to regulate student behavior and enhance students' emotional skills. Upgrading teacher academic qualifications can also promote pertinent instructions according to students' peculiarities and guide individual students to achieve distinctive and diversified development. These benefits beyond academic achievements deserve further studying.

In benchmarking the relevant indicators of OECD countries to promote the development of education in China, it is necessary to consider China's economic development level as a upper-middle-income country, the scarcity of high-quality educational resources and the unbalanced development of education at the current stage. Under the principle of steady change and gradual advancement, empirical models based on large sample data should be built to measure the marginal costs and marginal benefits of different programs to formulate a more scientific and efficient strategy for the high-quality development of compulsory education.

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