

The Effect of Education Groups on the Quality of Urban and Rural Compulsory Education: An Empirical Analysis Based on CEPS Data

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Abstract: *We retrieved data from China Education Panel Survey (CEPS) and adopted the hierarchical linear model as well as the quantile regression method to examine the effect of education groups on the quality of urban and rural compulsory education. Student cognitive ability was cited as the evaluation index of education quality. According to the research findings, the overall effect of education groups on the quality of compulsory education is significantly positive, but there is urban-rural heterogeneity in this effect: the positive impact occurs only to urban member schools, while the education quality of rural member schools has not been improved by school grouping. In addition, there exists individual difference in this effect; school grouping significantly and negatively affects students from rural member schools and with medium and lower cognitive ability.*

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Introduction

The education group at the compulsory education level is a form of school association composed of a certain number of primary and/or junior secondary schools that are contractually tied to achieve scale effect. It is designed to expand access to high-quality educational resources through the alliance of advantaged and disadvantaged schools. An education group constituted by prestigious urban schools and ordinary rural schools is established to universalize the frontier educational concepts and school management skills of the former and to promote the balanced development of urban and rural compulsory education. Based on the data from the China Education Panel Survey (CEPS) 2013-2015, this study uses the hierarchical linear model (HLM) and quantile regression method to evaluate the effect of education groups on the quality of urban and rural compulsory education quality as well as on the development of cognitive competencies of students with differential cognitive levels. The purpose of this paper is to identify the specific effects of school grouping on bridging the quality gap between urban and rural schools and to optimize the strategies for education group operation.

Data Source

This study sampled students who participated in the CEPS baseline survey of 2013-2014 academic year and the follow-up survey of 2014-2015 academic year and drew the data of 6520 students from 88 schools. In the stage of baseline survey, they were in grade 7. Five of the sampled schools were members of education groups and contributed 316 students for this investigation, which accounted for 4.85% of the total sample of students. Further analysis showed that in the districts where the five schools are located, there are altogether 12 schools (715 students) included in the sample and that in this case, the portion of students from member schools of education groups was 44.20%.

Research Findings

Statistical Descriptions of Member Schools of Education Groups

According to the sample analysis results, students from member schools of education groups, compared with their peers from non-member schools, displayed considerably higher cognitive ability and featured a lower proportion of rural “registered residence” (Hukou) as well as a higher share of “the only child in the family”. Member schools of education groups are more likely to be located in urban areas, with higher school rankings, stronger school finances, and higher teacher qualifications. Nonetheless, there were no remarkable differences in basic facilities and student-teacher ratio between member and non-member schools.

The Impact of School Grouping on Student Cognitive Ability

Full Sample Estimation

OLS regression analysis results showed that education group membership of the school had a significant positive effect on the development of student cognitive ability, while school location in rural areas has a remarkable negative influence on the cultivation of student cognitive ability. The incorporation of coefficients of interaction terms into the analysis confirmed the urban-rural heterogeneity in the impact of school grouping. School rural location weakened the marginal effect of school grouping by 0.334 units, which reversed the positive impact of 0.208 units contributed by the variable of school grouping ($0.208 - 0.334 = -0.126$). Consistent with the OLS estimation results, in the hierarchical linear model, the coefficient of the variable of school grouping was significantly positive, while those of school location and interaction terms are significantly negative. Moreover, a comparison of the coefficients indicated that the cognitive ability of rural students was not positively affected by the factor of school grouping, but rather declined ($0.176 - 0.271 = -0.095$).

Estimation of the Sample from the Districts Where Member Schools of Education Groups are located

The OLS regression analysis results of the sample from the districts where member schools of education groups are located also pointed to prominent urban-rural heterogeneity in the effect of school grouping. Overall, school grouping had a significant positive impact on student cognitive ability, but the coefficients of interaction terms demonstrated that the cognitive ability of students from rural member schools of education groups was remarkably lower than that of their urban counterparts by 0.914 units, which directly turned the overall positive influence of school grouping into a substantial negative impact ($0.284 - 0.914 = -0.630$). The hierarchical linear model also demonstrated high appropriateness. The result of chi-square test of zero model is significant. Disparities between schools accounted for about 27.1% of the gap in cognitive ability between students; Individual and family factors can partially explain the gap in student cognitive ability. The estimation results showed that the coefficients of the variable of school grouping and interaction terms are of significant levels, and there was positive-negative differentiation in their values. As a result, the influence of school grouping on rural students' cognitive ability was substantially negative ($0.250 - 0.740 = -0.490$).

The Influence of School Grouping on Different Student Cohorts

The regression coefficients of the variables of school grouping and interaction terms are significant at both the 25% and 50% quantiles. School grouping benefited urban students with below-average and medium cognitive ability (QR₂₅ and QR₅₀) more

than any other student cohort, by an improvement of 0.476 and 0.537 units. For rural students with these levels of cognitive ability (QR_25 and QR_50), the effect of school grouping is reversed to -0.643 (0.476-1.119) and -0.440 (0.537-0.977) units, which means that the development of rural students with medium or below-average cognitive ability was severely impaired by the school's membership in education group.

Discussion and Conclusion

The efficacy of education groups was confirmed by the research results in that the sharing of staff, curriculum content, and campus culture among member schools have helped increase student education output. The yearly teacher in-service training of member schools of education groups increased from 10.3 to 22 times on average, and its baseline level, follow-up level and growth rate were all higher than the averages of non-member schools in the same district; and the growth rate of teacher training of rural member schools has exceeded 300%, much higher than that of their urban counterparts.

Two types of costs should be taken into consideration in the exploration of the specific reasons for the heterogeneous effects of education groups on urban and rural compulsory education. (i) Explicit costs: in the practice of school grouping, urban member schools benefited from the sophisticated inner-city and inter-city transportation systems and ideal digital environments, which enabled the effective sharing of high-quality courses and the smooth rotation of excellent teachers and administrators. In contrast, due to the geographical separation and the "digital divide" between urban and rural areas, high-quality educational resources were less accessible to rural member schools. (ii) Implicit costs: During the two years of the CEPS, the sampled member schools of education groups were in the early stage of cooperation, experiencing a difficult transition from heterogeneity to homogeneity. The survey results of school satisfaction reflected the above costs in a direct way from the students' perspective. Students at rural member schools had a much higher level of academic weariness and stronger intention of school transfer than their urban counterparts.

This study drew the following conclusions: first, the education group has a significant positive influence on the quality of compulsory education and can effectively promote student cognitive ability; second, the influence of the education group is heterogeneous in urban and rural areas with the positive effect existing only among urban member schools, and the quality of compulsory education in rural member schools may decline rather than improve; and third, there is individual heterogeneity in the impact of school grouping, and the impact on rural students with medium and lower cognitive ability is the most significantly negative. The education group is a new form of school organization, and the association of urban and rural schools will progressively improve in practice and in mutual adaptation.

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