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Bridging the education gap: the role of private organizations in rural China

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Abstract: Inequality in education is a significant challenge in China. Through a case study, this research examines the impact of private organizations on rural students' academic performance. The study compares student performance before and after the private educational programs intervention and analyzes the differences between these students and a control group of students with comparable socioeconomic backgrounds. The findings suggest that private organizations play a crucial role in enhancing educational quality in rural regions, particularly by improving teacher training, providing supplementary educational resources, and supporting student engagement, which have a potential to narrow the rural-urban education gap.

Key words: educational inequality; rural-urban gap; private educational interventions; academic performance

1 Introduction

Educational inequality in China, particularly between urban and rural regions, continues to remain a substantial issue despite decades of reforms and public investments. China has made remarkable progress in promoting access to education by setting up the nine-year compulsory education system and improving education infrastructure. However, the disparity that lies in the quality of education provided and student outcomes perpetuates socioeconomic inequality and hinders the opportunities for rural students.

The rural-urban education gap in China has significant consequences. Education is one of the key driving forces of social mobility, yet the disparity in educational quality between rural and urban areas limits the ability of rural students to compete with others and results in intergenerational poverty. The objective of this research is to explore how private forces can address educational inequality between China's urban and rural regions, in particular, how private organizations can complement government efforts to improve education quality. This research provides a comprehensive examination of the current educational circumstances in rural China and identifies ways to enhance educational quality. By examining both quantitative data and case studies, this study will offer insights into the potential for public-private partnerships to improve educational outcomes in rural areas and narrow the rural-urban education gap.

2 Background

2.1 Compulsory education system and quality

China's Compulsory Education Law enacted in 1986 mandates nine years of education for all children, consisting of six years of primary school education and three years of junior secondary education. While this policy has achieved a

95.5% coverage rate in expanding educational access in rural areas according to the National Bureau of Statistics of China, the access to higher education in rural areas remains significantly lower than that in urban areas [1]. The Stanford Rural Education Action Program finds out that while more than 90 percent of rural students enter middle school, only 30 percent end up in high school. Moreover, only 1.3 percent of rural students attend universities, compared to the national average of 31% [2]. Further, *The China Quarterly* reveals that rural youth were five times less likely than urban youth to access four-year colleges and seven times less likely than urban youth to access an elite "Project 211" college [3]. The quality of education is also problematic, in 2016, 78.6% of rural middle school teachers had a bachelor's degree or above, which is 11.7% lower than urban middle schools [4]. On average, rural teachers have lower levels of formal education and less amount of professional training compared to their urban counterparts. This shortage of qualified teachers in rural schools resulted in many students being unable to pass the college entrance examination.

2.2 Infrastructure

Rural schools have historically faced significant infrastructural challenges. Over the past decades, thousands of rural schools have been shut down as part of government efforts to save resources. This policy was designed to use rural education resources more efficiently but had the unintended consequence of limiting access to education for a significant number of rural students. Many were forced to travel long distances to attend other schools, and some even dropped out due to the lack of nearby educational facilities. For instance, from the China Labour Bulletin, in 2015 alone, 10,000 primary schools were closed, mainly in rural regions [5]. Government initiatives have sought to address these issues by increasing investment in rural educational infrastructure, but a gap remains between urban and rural school facilities. In terms of resource allocation, rural schools receive significantly less funding compared to urban schools [6]. According to data from 2011, expenditure on education per rural student was 700 yuan less than for the urban student for elementary school and 900 yuan less for junior middle school [7]. *China Daily* reports that in 2018, 178,700 "super-classrooms" in primary schools and 86,300 in middle schools in rural areas account for 6.49 percent and 8.62 percent of the total classes in China [8].

2.3 Extracurricular classes

In China, while urban students often have access to private tutoring and a wide range of extracurricular activities, rural students lack these opportunities due to financial constraints and geographical isolation. Studies highlight that private tutoring is significantly and positively associated with student test scores [9]. Even non-academic classes can have a long-term influence on cognitive abilities [10]. However, the statistics marked a difference in access to such opportunities: the rate of participation in supplementary tutoring was about 45.2% in wealthier urban areas and only about 25% in rural regions [11]. This gap in participation further reflects the economic divide between urban and rural families, as private tutoring often requires significant financial resources. In urban areas, families are more likely to afford additional academic support, which has become increasingly seen as a necessary investment in a child's future. In contrast, many rural families struggle to afford even basic educational costs, and private tutoring is often seen as an unnecessary luxury, exacerbating educational inequality.

2.4 Government spending

While government investment in rural education has increased in recent years, it has not been enough to bridge the gap between urban and rural schools. The majority of rural educational funding comes from local governments, which often struggles with financial shortages. Even though the central government provides some financial support, the *Journal of Education Humanities and Social Sciences* shows this only covers about 64.9% of rural educational costs, leaving the burden to be carried by local governments and individual families [12].

Private investment, however, has shown significant potential in improving educational quality in rural areas. Increasing private investment in education reduces poverty by 0.17% for every 1% increase in spending, demonstrating the importance of private interventions in addressing the rural-urban education gap and ensuring that rural students have access to the same educational opportunities as their urban peers [13].

2.5 Importance of education

Based on the analysis of data from the seventh population census in 2020, the regression shows that there is a positive correlation between the proportion of college students in a region and the per capita GDP, with a p-value of 0.027. Each solid circle in the graph represents a county.

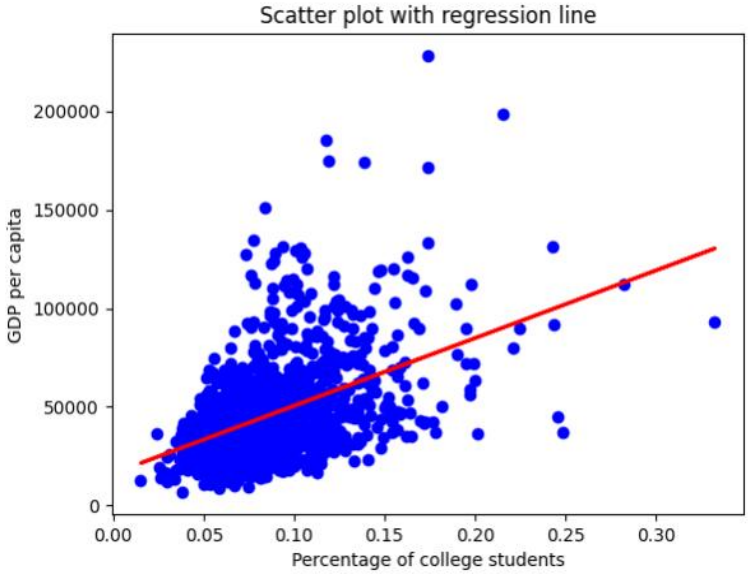

Figure 1. The interrelationship between education and economic development

The graph showing a positive correlation between the percentage of college students and per capita GDP illustrates the interconnectedness between education and economic development. The feedback loop between these two factors creates a sustainable development model, where economic success and educational progress reinforce each other. Improving educational outcomes in rural regions contributes to economic growth, which demonstrates the need for educational reforms to reduce socioeconomic disparities.

3 Case study methodology

3.1 Research design and experimental intervention

The organization examined in this study is a non-profit volunteer group that provides courses beyond training in test-taking or subject-focused tutoring. It emphasizes the development of practical soft skills such as argumentation, communication, and problem-solving, which are not covered in the traditional education system of rural regions. The program includes a variety of creative classes such as English drama, business negotiation, economics and entrepreneurship, critical thinking, etc., emphasizing a more enriched learning experience. The private intervention impacts student performance in multiple ways. By engaging students in interactive and creative courses, the program increases students' enjoyment of school and boosts their motivation. As they become more interested and confident in their learning, the students develop a stronger commitment and put more effort into their studies, which, in turn, improves their academic performance. The study aims to evaluate the impact of this private educational intervention on student performance in schools implementing the program. Specifically, we compare the academic performance before and after the intervention for students enrolled in private courses as well as the performance between students enrolled in and those not enrolled in

the classes. There will be both within-group and between-group comparisons. The experimental group consists of students who participated in the private educational program for one semester, and the control group includes students from similar socio-economic backgrounds who didn't receive the private intervention.

3.2 Participants and data collection

There are 18 students selected for the experimental group based on their enrollment in the courses provided by the organization. Another 101 students from the same school were selected for the control group to ensure they had demographic and educational backgrounds similar to those of the experimental group. The pre-intervention data comes from the grades of all participants in the same test before the course started, and for the post-intervention data, the grades of all the participants were collected again after the private course was completed. The two tests are both semester finals that have the same format and grading scale out of 100 points.

3.3 Statistical analysis

To analyze the effectiveness of the intervention, two types of statistical tests were conducted. The paired T-test is applied to the experimental group to compare student performance before and after the course to evaluate whether there is a significant improvement in student grades by taking the course. The same is applied to the control group to account for any external factors, such as natural improvements over time or difficulty of the test. It ensures that any changes observed in the experimental group are not simply due to the general trend in grade improvements for all students. The two-sample T-test is used to compare the post-intervention grades of the experimental group with the control group to determine whether students taking the private course outperformed those who did not.

4 Results and discussions

4.1 Results

The statistical analysis demonstrates clear evidence of the effectiveness of private educational intervention in improving academic performance among students. The results are summarized below:

4.1.1 Paired T-test for the experimental group and control group

The paired t-test comparing pre- and post-intervention grades for the 18 students in the experimental group revealed a statistically significant improvement in their academic performance after completing the private educational program, indicating a positive impact of the program on student grades. Students demonstrated an average improvement of 4.61 points, with a 95 percent confidence interval of [1.18, 8.04] and a p-value of 0.0057.

In contrast, the paired t-test for the 101 students in the control group, who did not receive any private educational intervention, showed an average of 2.83 points reduction in grades, with a 95 percent confidence interval of [-4.71, -0.95] and a p-value of 0.0006. This suggests that without additional support, the academic performance of students may decline over time.

4.1.2 Two sample T-test

The two-sample t-test comparing post-intervention grades between the experimental and control groups revealed a statistically significant difference. Students in the experimental group outperformed those in the control group after the intervention by an average of 9.96 points, with a 95 percent confidence interval of [5.56, 14.36] and p-value=0.000016 < 0.05. This further shows that the private intervention is effective.

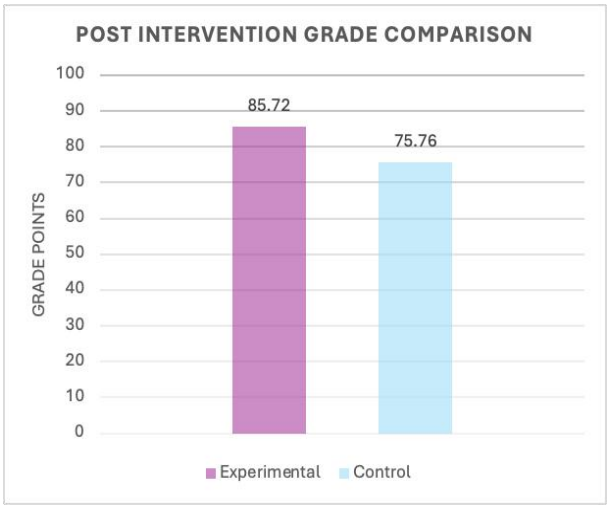

Figure 2. Post intervention grade comparison

4.1.3 Effect size

Cohen's d is 0.622 for the paired t-test of the experimental group and 0.621 between the experimental and control groups. Both show a moderate to strong effect of the intervention.

4.2 Limitations

4.2.1 Sample size

Because of the restrictions of education and privacy policies in China, only a few schools can provide student academic data, so the relatively small sample size of the experimental group may limit the generalizability of the result. However, the inclusion of a larger control group (111 students) helps mitigate this issue.

4.2.2 Variation in teachers and students

Although the courses are standardized, slight differences in the engagement of students and instruction from teachers might affect the result.

4.2.3 External and random factors

The results may be specific to the educational environment in which the study was conducted and may not be easily generalized to other regions with different conditions.

4.3 Evaluations

4.3.1 Impact

The statistically significant improvement in the experimental group's grades, as demonstrated by the paired t-test, provides clear evidence that the private educational program was effective in enhancing academic outcomes. This aligns with previous studies suggesting that private sector interventions can play a crucial role in improving the quality of education in underdeveloped regions where government efforts alone have been insufficient. The two-sample t-test result further reinforces this conclusion, as the experimental group significantly outperformed the control group, which did not experience any meaningful improvement in academic performance over the same period and was falling behind those in the experimental group. This suggests that the intervention had a direct and measurable effect on the students who participated in the program.

4.3.2 Quality of education

The results show that the quality of education remains a major challenge. The private intervention, which focused on innovative teaching methods and increasing student engagement, demonstrated that such programs can have a substantial impact on student outcomes. In contrast, for students in the control group who received only the basic education provided

by the government, their average grades remained low and became even worse as time progressed. This indicates that while government efforts have succeeded in providing access to education, they may not be sufficient to improve the quality of education in rural areas, so there is a need for complementary private interventions.

4.3.3 Practical significance

The effect size analysis using Cohen's d suggests that the private intervention had a moderate to strong impact on student performance, indicating that the improvement observed was not just statistically significant but also non-negligible. The effect size underscores the potential for private educational programs to make a substantial contribution to closing the educational gap between urban and rural regions.

4.3.4 Policy implications

The findings of this study suggest that private organizations are essential in addressing educational inequality in China. Government efforts to improve access must be complemented by targeted interventions aimed at improving the quality of education, particularly in underdeveloped regions. The government should encourage more private sector involvement in rural education through the following initiatives:

1) Tax incentives and subsidies: The government should invest more in extracurricular programs to lower the financial burden of private organizations to establish projects in underdeveloped regions.

2) Public-private partnerships: The government should work closely with private organizations to design targeted programs.

3) Evaluation system: The government should set up standards to assess the effectiveness of private sector interventions for both short-term and long-term performances.

5 Conclusion

This study highlights the vital role that private organizations can play in improving the quality of education in rural China, especially where government efforts are insufficient to offer high-quality education. Through the examination of a private intervention program, which introduced creative courses and practical skills development, the research revealed a statistically significant improvement in student outcomes with an average increase of approximately 5% in scores. Moving forward, greater attention should be given to scaling such programs and evaluating their long-term impact on rural student success while integrating these efforts into broader government strategies aimed at reducing socioeconomic disparities. Through collaboration, the public and private sectors can establish a more equitable educational system that offers rural students the quality of education they deserve and narrows the rural-urban education gap by providing new pathways for social mobility. It is highly recommended that future studies incorporate larger datasets and analyze long-term impacts.

Conflicts of interest

The author declares no conflicts of interest regarding the publication of this paper.

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