DOUBLE REDUCTION POLICY INFLUENCING PRIMARY AND SECONDARY EDUCATION QUALITY: EVIDENCE FROM QINGDAO CITY, SHANDONG PROVINCE, CHINA

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ABSTRACT

This study examined whether the Double Reduction Policy influences the quality of primary and secondary education in Qingdao City, Shandong Province, and which of its components carry that influence: class quality, after-class homework, after-school tutoring classes, family education and the urban-rural gap. Multi-stage stratified random sampling produced 392 students in grades 3 to 9 from 20 public schools. The questionnaire held 43 items in four parts, content validity was confirmed by three experts through the index of item-objective congruence, and Cronbach's alpha reached .957. Data were analyzed in jamovi with descriptive statistics, Pearson correlation and linear regression at the .05 level. The research results showed high-level opinions of the policy (M = 3.81) and of education quality (M = 3.87). The policy influences education quality with a predictive power of 49.0 percent (R^2 = .490, $p < .001$), and its five components together reach 49.5 percent (R^2 = .495, $p < .001$). Every component contributed significantly. Ranked by standardized estimate: the urban-rural gap (β = .283), after-school tutoring classes (β = .188), class quality (β = .181), after-class homework (β = .157) and family education (β = .123). Balanced urban and rural provision therefore deserves first priority in Qingdao, with classroom teaching and homework design close behind.

Keywords: Double Reduction Policy, Education Quality, Urban-Rural Gap, Qingdao

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INTRODUCTION

In July 2021, China officially introduced the "Double Reduction" policy, targeting two major pain points for students in compulsory education: the heavy homework load and the chaos in off-campus tutoring. The policy's goal is not just simple "subtraction"; it also aims to push schools back to being the main place for nurturing students, promoting their all-around development in virtue, intelligence, physical health, aesthetics, and labor. But what will the real effects of the policy look like in different cities, and between urban and rural areas? A master's study in educational administration at Suan Sunandha Rajabhat University in Thailand focused on the coastal city of Qingdao, trying to answer this pressing question.

A mixed reality: Opportunities and challenges coexist after reducing the burden

A review of research literature shows that the changes brought by the "Double Reduction" policy are complex and multi-faceted. Data from some regions indicate that reducing homework and providing after-school services can improve students' subjective well-being without harming academic performance. At the same time, practical conflicts have emerged: some subject tutoring moved underground, the cost of one-on-one private tutors skyrocketed; teachers taking on after-school services, homework optimization, and home-school communication face longer working hours and higher risks of burnout.

Not all groups benefit equally. Some studies found that after controlling off-campus tutoring, the academic performance of students from low-income families declined, while wealthy families could make up for resource gaps with expensive private tutoring. Meanwhile, the overall incidence of depression and anxiety among adolescents decreased, but some middle school students' sleep duration continued to shrink. The educational gap between urban and rural areas remains an unavoidable reality.

Qingdao, as a major educational city on the eastern coast, has both resource-rich central urban districts and rural schools in county towns. By the end of 2024, the city had 764,400 primary school students and 302,800 middle school students. The city has been actively promoting educational group-based management, with 85% of primary and secondary schools incorporated into group-based development and a large-scale construction and expansion of schools. However, discrepancies still exist in teacher quality, arts education resources, and after-school service availability between urban and rural areas, making it a good place to observe the real impact of the "Double Reduction" policy.

Most previous domestic studies have focused on places like Beijing, Wuhan, and Jiangsu, mainly analyzing from the perspective of teachers or parents. Empirical research comparing urban and rural disparities from the students' own experiences while considering five comprehensive aspects of education—morals, academics, physical and mental health, aesthetic appreciation, and labor practice—is still relatively rare. This study fills that gap.

Five key variables determine the effectiveness of the policy

The study breaks down "Double Reduction" into five observable dimensions: classroom teaching quality, homework design, after-school tutoring and school-based after-school services, family education, and urban-rural educational gaps. It evaluates education quality beyond mere scores, aligning with the national "Guidelines for the Quality Evaluation of Compulsory Education," and uses five assessment directions: moral development, academic

development, physical and mental development, aesthetic literacy, and labor and social practice.

LITERATURE REVIEWS

"Concepts and Theories Related to the 'Double Reduction' Policy

The 'Double Reduction' policy was officially launched in July 2021, aiming to reduce the homework and off-campus tutoring burden for students in the compulsory education stage, return to the public welfare nature of basic education, and promote students' overall development (General Office of the CPC Central Committee & General Office of the State Council, 2021). Scholars have multiple interpretations of the policy. Besides the official perspective of reducing burden, some studies view it as a practice of pursuing all-around education, while critical perspectives argue that the exam-oriented admission system may limit the policy's effectiveness (Xue & Li, 2023; Chen & Lin, 2024).

After the policy was implemented, subject-based off-campus training institutions were significantly reduced, but the demand for tutoring shifted to underground, hidden forms; teachers took on new tasks such as after-school services and homework optimization, highlighting issues of professional anxiety and burnout; households with different incomes were affected differently, and some of the competition pressure shifted within families (Xue & Cai, 2026; Yue et al., 2023; Shcheglova et al., 2025).

This study is based on five theoretical frameworks: the education production function theory explains that educational outcomes are influenced by multiple investments from schools and families, and that homework exhibits diminishing marginal returns (Li et al., 2024); the shadow education-cultural capital theory shows how family capital can expand educational inequality through tutoring (Luo & Chan, 2022); self-determination theory highlights that satisfying needs for autonomy, competence, and relatedness can stimulate students' intrinsic learning motivation (Ryan et al., 2022); the bioecological systems theory places the policy within micro, meso, exo, and macro layers, with urban-rural gaps as an important contextual variable (Navarro & Tudge, 2023); and the stakeholder perspective points out that policy effectiveness is jointly constrained by teachers, parents, and local implementation (Ji et al., 2025).

The policy is divided into five implementation dimensions: classroom quality, homework, off-campus tutoring, family education, and urban-rural education gaps. Classroom reform is core and needs to make up for the learning time lost due to reduced homework and tutoring (Deng, 2023); homework reform balances reduction and stratified feedback (Xie & Qian, 2024); on-campus after-school services need to partially replace off-campus tutoring functions (Gong et al., 2025); family education focuses on nurturing quality rather than participation frequency (Standing Committee of the National People's Congress, 2021); and urban-rural resource differences can moderate the implementation effects of other policy elements (Zheng et al., 2023)."

Overview of Primary and Secondary Schools in Qingdao and Research Gaps

There are over 1.06 million students enrolled in compulsory education in Qingdao. The city promotes education through school group systems to support weaker schools, but there are still gaps in teacher resources, after-school services, and arts education between counties,

rural areas, and central urban districts. Competition for high school entrance exams continues to impact the local education environment (Qingdao Municipal Bureau of Statistics & NBS Survey Office in Qingdao, 2025; Qingdao Evening News, 2025).

From the literature review, the conceptual framework can be drawn as shown in Figure 1.

H1: The five areas represent the fields that the 'Opinions' regulate or encourage: classroom teaching, homework, after-school services and off-campus tutoring, home-school cooperation, and balanced development between urban and rural schools (Chen & Lin, 2024).

H2: The five dimensions represent the national evaluation guidelines (MOE, 2021) and correspond to the five aspects of holistic development mentioned in the policy (Xue & Li, 2023).

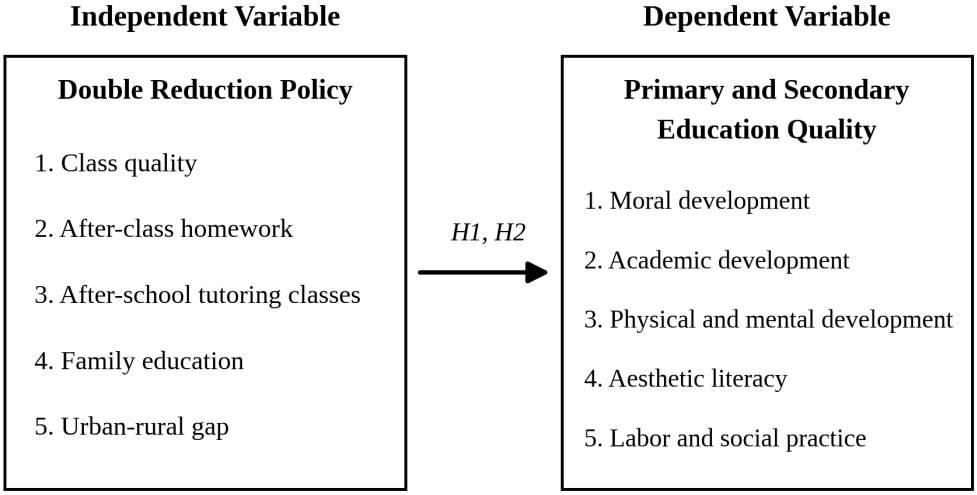


Figure 1 Conceptual Framework Adapted from Chen & Lin, 2024, Xue & Li, 2023.

RESEARCH METHODOLOGY

This study is a cross-sectional quantitative questionnaire survey. Data were collected using self-reported student questionnaires, and analyses including descriptive statistics, Pearson correlation, and multiple linear regression were conducted with Jamovi software, with a significance level of $\alpha = 0.05$. The population of the study was students in the compulsory education stage in Qingdao (a total of 1,067,200 by the end of 2024, including 764,400 in primary schools and 302,800 in middle schools). The target participants were public school students in grades 3-6 of primary school and grades 7-9 of middle school; grades 1-2 were excluded due to no written homework and insufficient questionnaire reading ability. The sample size was calculated using Yamane's formula with 95% confidence and 5% error, giving a minimum sample size of 400, and 440 questionnaires were distributed (reserving 10% for invalid responses). A multi-stage stratified random sampling was used: Stage 1 stratification divided areas into city center and suburban/county-level areas; Stage 2 randomly selected 5 primary schools and 5 middle schools from each layer, for a total of 20 public schools; Stage 3 randomly selected complete classes from the corresponding grades at each school; Stage 4 randomly selected students within the classes. Ultimately, 392 valid questionnaires were recovered, with an effective recovery rate of 89.09% and an error of 5.05%. Sample demographics: 221 primary students in grades 3-6 (56.38%) and 171 middle school students in grades 7-9 (43.62%); 190 boys and 202 girls; 163 from the city, 101 from

towns, and 128 from rural areas. The research instrument was a self-developed student questionnaire with 43 questions divided into 4 sections.

RESEARCH RESULTS

Respondents' Profiles and Studied Variables

As shown in Table 1, out of the 392 respondents, 221 (56.38%) were students in grades 3-6 and 171 (43.62%) were students in grades 7-9. The primary school respondents formed the larger group of the two. The actual distribution was 56.38% for primary school and 43.62% for secondary school compared to 72% and 28%, respectively, in Table 2. Thus, the proportion of secondary school respondents in this study was higher than planned. This limitation is also discussed in Section 5.4. The number of female students (n=202; 51.53%) and male students (n=190; 48.47%) was almost the same. There were 163 students in city schools (41.58%), 128 in rural schools (32.65%) and 101 in township schools (25.77%). Thus, 229 students (58.42%) did not attend urban schools. The urban-rural comparison that Chapter 2 treats as the context for every other component therefore rests on a substantial group of students on each side.

Table 1 General Information of Respondents (n = 392)

General information of respondents	Frequency	Percentage
Grade		
Grades 3-6	221	56.38
Grades 7-9	171	43.62
Gender		
Male	190	48.47
Female	202	51.53
Region type		
City	163	41.58
Townships	101	25.77
Rural areas	128	32.65
Total	392	100.00

Table 2 Population and Sample by Stratum

School level	Population (students)	Proportion (%)	Central urban districts	Suburban districts and county-level cities	Total sample
Primary school	764,400	71.63	144	143	287
Junior secondary school	302,800	28.37	57	56	113
Total	1,067,200	100.00	201	199	400

Mean and Standard Deviation of the Double Reduction Policy

As seen in Table 3, the respondents generally expressed positive opinions toward the Double Reduction Policy as a whole (M = 3.81, SD = 0.52). In descending order of their means, family education had the highest mean score (M = 4.00, SD = 0.62), followed by class quality (M = 3.99, SD = 0.64), after-class homework (M = 3.82, SD = 0.67), after-school tutoring classes (M = 3.70, SD = 0.73), and finally the urban-rural gap (M = 3.54, SD = 0.78). While all five of these components are found in the agree section of Table 4, they do not occupy the same position within that band: the 0.46 scale-point difference between family education and the urban-rural gap is the largest discrepancy in the entire data set, and the standard deviations grow larger as the means decline, suggesting that students disagreed most strongly about the very component they rated lowest.

Table 3 Mean and Standard Deviation of the Double Reduction Policy

Double Reduction Policy	N	Mean	SD	Level of agreement
Class quality	392	3.99	0.64	Agree
After-class homework	392	3.82	0.67	Agree
After-school tutoring classes	392	3.70	0.73	Agree
Family education	392	4.00	0.62	Agree
Urban-rural gap	392	3.54	0.78	Agree
Total	392	3.81	0.52	Agree

Table 4 Criteria for Interpreting Mean Scores

Mean score	Level of agreement	Interpretation
4.21 to 5.00	Strongly agree	Highest
3.41 to 4.20	Agree	High
2.61 to 3.40	Neutral	Moderate
1.81 to 2.60	Disagree	Low
1.00 to 1.80	Strongly disagree	Lowest

Results of the primary and secondary education quality data analysis

As Table 5 demonstrates, the respondents had a relatively high opinion of the quality of primary and secondary education (M = 3.87, SD = 0.64). The nine items span a narrow range of 0.04 of a scale point, the smallest in the questionnaire. Participants most strongly endorsed the item “Students demonstrate better participation and engagement in classroom learning” (M = 3.89, SD = 0.82) and second-most strongly endorsed “Students are able to achieve learning objectives more effectively” (M = 3.88, SD = 0.82), and least endorsed “The school provides learning experiences that better meet students’ diverse educational needs” (M = 3.85, SD = 0.80). Importantly, for the purposes of this study, the item “Students’ excessive academic burden has been reduced without negatively affecting the quality of learning” scored a mean of 3.86 (SD = 0.81), placing the study’s core research question, that less can yield more, in the agree category of responses for this sample.

Table 5 Mean and Standard Deviation of Primary and Secondary Education Quality

Primary and Secondary Education Quality	N	Mean	SD	Level of agreement
The overall quality of teaching and learning in the school has improved.	391	3.87	0.81	Agree
Students demonstrate better participation and engagement in classroom learning.	390	3.89	0.82	Agree
Students are able to achieve learning objectives more effectively.	391	3.88	0.82	Agree
Students experience a more balanced learning environment between academic study and personal development.	390	3.87	0.81	Agree
The school provides learning experiences that better meet students' diverse educational needs.	391	3.85	0.80	Agree
Students have developed broader skills and interests through physical, artistic, practical, and extracurricular activities.	391	3.87	0.83	Agree
The school provides more effective academic guidance and learning support for students.	391	3.87	0.78	Agree
Students' excessive academic burden has been reduced without negatively affecting the quality of learning.	391	3.86	0.81	Agree
The implementation of the policy has contributed to students' overall development.	388	3.87	0.81	Agree
Total	392	3.87	0.64	Agree

Assumption Checks for the Regression Models

Table 6 shows that the Durbin-Watson statistic is 2.056, which is close to the ideal value of 2, indicating that the assumption of independence of errors was met. Assumptions of multicollinearity were also satisfied, as all components had a variance inflation factor ranging from 1.39 to 1.67, well below the cut-off of 5 (Hair et al., 2022), and the tolerance levels ranged from 0.60 to 0.72, never dropping below 0.60. The Shapiro-Wilk test confirmed the assumption of normally distributed residuals ($W = 0.994$, $p = .146$). With the highest absolute standardized residual value reaching 2.93, there were no outliers according to the screening limit of 3.29. Similarly, the maximum Cook's distance of 0.048 suggested that there were no cases highly influencing the model. However, the Breusch-Pagan test was significant ($p = .032$), suggesting some degree of heteroscedasticity. As a further check, the models were rerun with robust standard errors (heteroscedasticity-consistent standard errors). All coefficients maintained their sign, magnitude and significance, and the maximum change in any coefficient's standard error was 0.003. Thus, the results presented below are not affected by unequal variances of errors.

Table 6 Assumption Checks for the Regression Models

Assumption	Statistic	Value	Criterion	Result
Independence of errors	Durbin-Watson	2.056	Close to 2	Met
Normality of residuals	Shapiro-Wilk W	0.994	p > .05	Met
	p	.146		
Homoscedasticity	Breusch-Pagan p	.032	p > .05	Not met
Influential cases	Cook's distance (max)	0.048	< 1	Met
Univariate outliers	Standardized score (max)	2.925	< 3.29	Met
Collinearity: Class quality	VIF	1.642	< 5	Met
After-class homework	VIF	1.618	< 5	Met
After-school tutoring classes	VIF	1.666	< 5	Met
Family education	VIF	1.603	< 5	Met
Urban-rural gap	VIF	1.393	< 5	Met
Tolerance (minimum)	Tolerance	0.600	> .20	Met

Note. n = 392. The models were re-estimated with heteroscedasticity-consistent standard errors; no coefficient changed in sign, size or significance.

Pearson Correlation Matrix of the Study Variables

As Table 7 shows, all correlations are positive and significant at the .001 level. Education quality has the strongest correlation with the urban-rural gap (r = .552), followed by class quality (r = .538), after-school tutoring classes (r = .537), after-class homework (r = .510) and family education (r = .495). The correlations between the five components themselves range from .384 to .506, which is high enough to suggest that they represent one coherent policy, but low enough to mean that each component still has its own variance, as confirmed by the collinearity statistics in Table 6.

Table 7 Pearson Correlation Matrix of the Study Variables

Variable	1	2	3	4	5	6
Class quality	1.00					
After-class homework	.491	1.00				
After-school tutoring classes	.506	.504	1.00			
Family education	.465	.501	.504	1.00		
Urban-rural gap	.454	.384	.413	.406	1.00	
Primary and secondary education quality	.538	.510	.537	.495	.552	1.00

Note. n = 392. All correlations are significant at p < .001.

DISCUSSION & CONCLUSION

From the perspective of student perception, the 'Double Reduction' policy overall has a significant positive prediction of the quality of primary and secondary education in Qingdao, explaining 49.0% of the variation; the five major components together explain 49.5%, and all five components have significant positive predictive effects. The ranking of predictive influence is: urban-rural gap > after-school tutoring > classroom quality > homework > family education. Balanced urban-rural resources are the most important predictor, even

though students rate the current balance lowest and have the largest disagreements. Family education gets the highest subjective student rating, but its unique predictive effect is the weakest. Students in the sample generally give high evaluations for all dimensions of the 'Double Reduction' policy as well as overall school education quality. The urban-rural dimension scores closest to neutral, reflecting that the perceived resource gap between urban and rural schools in Qingdao is still obvious. The five components are highly interconnected and work as a coordinated whole, so implementing them separately has limited effect. More than half of the variation in education quality cannot be explained by the 'Double Reduction' policy, and external factors like the exam-oriented system for middle school entrance exams are still important.

Research Limitations and Future Research Directions

We only used cross-sectional data, so we can only find correlations, not strict causal relationships; in the future, we suggest longitudinal cohort studies and difference-in-differences approaches. All data came from students' self-reports, which may introduce common method bias. Future studies should combine classroom observations, objective academic indicators, and triangulation from teachers and parents. We measured students' subjective perceptions of education quality, but future research should objectively assess the official five dimensions like moral education, arts education, and labor practice. The sample was limited to Qingdao, so generalization is constrained; the proportion of junior high students was slightly higher than planned; and without school IDs, clustering could only be done at the regional level. Future studies should expand to other cities in Shandong and include perspectives from teachers and parents.

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Data Availability Statement: The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

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