The Impact on Regional Dynamics and Guarantee Systems of Promoting Balanced Development in Compulsory Education across Shaanxi Province, China

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Abstract
This research is a mixed-methods study that investigates the relationship between guarantee systems, regional dynamics, and educational equity in Shaanxi Province, focusing on the urban-rural education gap. The primary objective is to identify factors contributing to educational disparities and evaluate the effectiveness of existing policies aimed at promoting balanced educational development. The methodology involved questionnaires with a sample size of 466 persons, including 160 educators, 80 parents, and 160 students. Participants were selected through stratified sampling to ensure representation from both urban and rural areas. Reliability analysis, correlation analysis, and regression analysis are used to analyze the data. The results show that at the level of 0.01, regional dynamics has a positive impact on the education guarantee system (0.704), at the level of 0.01, the education guarantee system has a positive impact on the promotion of balanced development (0.672), and at the level of 0.01, regional dynamics has a positive impact on the promotion of balanced development (0.691). The research highlights the need for policymakers to enhance community involvement and tailor educational programs to the unique challenges faced by underdeveloped areas. By doing so, the study aims to contribute to improved educational equity and quality in Shaanxi Province, ensuring that all students have access to the resources and support necessary for their academic success.

Keywords: Regional Dynamics, Guarantee Systems of Promoting, Balanced Development, Compulsory Education, Equality, Quality Education

Introduction

The balanced development of compulsory education is essential for national growth and social harmony. Shaanxi Province exemplifies the challenges of educational inequality in China, particularly the urban-rural divide. Despite the 2006 Compulsory Education Law mandating nine years of free education, significant disparities persist. Urban schools benefit from better funding, qualified teachers, and superior infrastructure, while rural schools struggle with insufficient resources, outdated facilities, and a lack of trained educators. These disparities limit opportunities for rural students and reinforce poverty cycles (Hanushek, 1992).

Regional dynamics, such as economic conditions, government policies, and cultural attitudes, further influence educational outcomes. Wealthier urban families often invest in supplementary education, while rural families prioritize economic survival over schooling. Cultural factors, including traditional gender roles and labor priorities in rural areas, also exacerbate the divide.

To address these issues, the Chinese government has implemented guarantee systems, which include funding programs, teacher training, and infrastructure upgrades, to reduce regional disparities. These systems aim to ensure equitable access to educational resources. However, their effectiveness depends on local socio-economic conditions. Disparities in income, parental education, and social capital within regions can either enhance or diminish the success of these systems, highlighting the need for tailored strategies that consider regional contexts (Qi & Rattanapun, 2024; Rattanapun et al., 2018; Rattanapun et al., 2022).

This study examines how regional dynamics and guarantee systems interact to promote balanced educational development in Shaanxi Province. Using quantitative methods, the study analyzes data from students, parents, and teachers to assess the impact of these variables. Findings reveal that regional dynamics significantly influence the effectiveness of guarantee systems and that addressing socio-economic and cultural barriers is critical to narrowing the urban-rural divide. The research aligns with China's efforts toward Sustainable Development Goal 4, which seeks inclusive and equitable quality education.

The study contributes both theoretically and practically, offering insights into the role of regional dynamics and guarantee systems in achieving balanced development. It provides policy recommendations for optimizing guarantee systems to reduce regional disparities and promote equitable education, ultimately supporting long-term social and economic development in China.

Research Questions

- Do regional dynamics affect the improvement paths of balanced development of compulsory education in Shaanxi Province?
- Does the guarantee system play in optimizing the balanced development of compulsory education in Shaanxi Province?
- Do regional dynamics jointly promote the balanced development of compulsory education in Shaanxi Province?

Research Objectives

- To study the impact of regional dynamics on the guarantee system of compulsory education in Shaanxi Province.
- To study the impact of guarantee system on promoting balanced development of compulsory education in Shaanxi Province
- To study the impact of regional dynamics on promoting balanced development of compulsory education in Shaanxi Province

Conceptual Framework

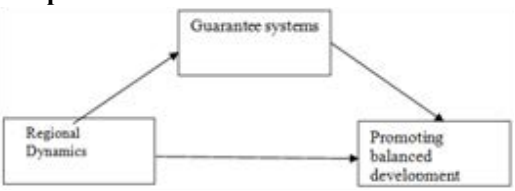

Figure 1 Conceptual Framework

The Relationship between Guarantee Systems (GS) and Regional Dynamics (RD)

Guarantee systems and regional dynamics are key factors influencing educational quality and equity. Guarantee systems, such as government-led funding, teacher training, and infrastructure initiatives, aim to provide equal access to education for all students. However, their effectiveness depends on regional dynamics, including socio-economic, cultural, and geographical factors. Wealthier regions with better infrastructure implement guarantee systems more successfully, offering improved resources and opportunities. Conversely, disadvantaged areas often struggle with insufficient funding, inadequate facilities, and limited teacher availability, exacerbating educational inequalities. Regions with diverse populations, such as migrant-heavy areas, also require tailored interventions, including language and integration support (Ager & Strang, 2008). Governance and community involvement further shape the success of guarantee systems.

Local governments and community stakeholders, understanding regional realities, can adapt policies to meet specific needs, ensuring better implementation. However, disparities in resource distribution, often favoring urban over rural areas, can hinder equitable outcomes. To bridge these gaps, guarantee systems must address socio-economic challenges and adapt to regional contexts. By ensuring balanced resource allocation, tailoring interventions to local needs, and involving communities, policymakers can enhance educational equity and improve outcomes for all students, regardless of location.

H1: Regional dynamics have a significant impact on guarantee systems.

The Relationship between Guarantee Systems (GS) in Promoting Balanced Development (PBD)

Guarantee systems are essential for promoting balanced educational development, particularly in regions facing socio-economic disparities. These systems, implemented through government policies, ensure equitable access to education by redistributing resources, providing financial aid, and setting quality standards. They address gaps between affluent urban areas and underprivileged rural regions, fostering educational equity and opportunity. Key elements include targeted funding for underserved areas, scholarships, and incentives to attract qualified teachers to disadvantaged regions, such as salary bonuses or housing support. Guarantee systems also focus on improving infrastructure by building and renovating schools, ensuring all students have access to conducive learning environments. However, their success depends on adapting to regional dynamics, which encompass socio-economic, cultural, and geographical factors. For example, regions with diverse populations may require tailored solutions, such as language programs for migrant communities. Additionally, involving local stakeholders ensures policies address specific needs, enhancing their effectiveness (Hargreaves, 2019). In conclusion, guarantee systems are pivotal in reducing educational inequalities by ensuring fair resource distribution and improving quality. Their effectiveness, however, hinges on flexibility, community involvement, and alignment with local needs, fostering equitable and sustainable educational development across regions.

H2: Guarantee systems have a significant impact in promoting balanced development.

The Relationship between Regional Dynamics (RD) in Promoting Balanced Development (PBD)

Regional dynamics significantly impact the balanced development of education, especially in areas with diverse economic and demographic contexts. Key factors include economic conditions, demographic trends, cultural contexts, and existing educational infrastructure, all of which shape how education policies are implemented. Economic disparity between urban and rural areas is a major challenge, with urban regions typically having more resources and better infrastructure. Rural areas face educational inequities, such as inadequate facilities and limited access to advanced coursework. Addressing these gaps requires targeted policies that allocate resources to underserved regions.

Demographic factors, such as population growth or decline, also influence education demands and resource allocation (Menghan & Rattanapun, 2024). Additionally, cultural norms can affect community engagement in education, influencing enrollment and dropout rates (Zhang et al., 2024). Policies must be tailored to regional characteristics and involve local communities to ensure equitable access to education (Rattanapun et al., 2018). By incorporating regional dynamics, education policies can promote balanced development and contribute to achieving SDG 4, which aims for inclusive, equitable, quality education.

H3: Regional Dynamics have a significant impact in promoting balanced development.

Research Methodology

This research employs a mixed-methods approach, including a survey questionnaire and document analysis, to gather comprehensive data from students, teachers, and parents. The study identifies disparities, assesses policy impact, and provides evidence-based recommendations to enhance educational equity and outcomes.

In this study, the calculation formula proposed by Yamane was adopted to determine the sample size. Yamane was adopted by the researchers with 95% confidence and a 0.05 accuracy level. Its basic form is 392. Considering the total population size and a

permissible error margin of 5%, a minimum of 392 valid questionnaires was required for this study. Based on actual collection data, 466 samples were utilized for subsequent data analysis.

This study used a variety of materials and tools for data collection, including questionnaires, measurement scales, observation checklists, and software tools. These materials were selected based on their ability to fit the research objectives and the nature of the data, ensuring the reliability and validity of the data and thereby supporting a comprehensive analysis of the research questions.

Results

Descriptive Analysis for Demographic Factors

Table 1 Overview of Respondents' Demographic Characteristics (N=466)

Variable	Frequency (n)	Percentage (%)
Gender		
Male	233	50
Female	233	50
Age		
Under 18	39	8.37
18-24	98	21.03
25-34	188	40.34
35-44	72	15.45
45-54	32	6.87
55 and above	37	7.94
Location		
Urban	234	50.21
Rural	232	49.79
Education Level		
High School	166	24.89
Bachelor's Degree	220	47.21
Master's Degree	96	20.6
Ph.D.	34	7.3
Income		
<2,000	134	28.76
2,000-3,999	106	22.75
4,000-5,999	126	27.04
6,000-7,999	56	12.02
8,000-9,999	29	6.22
10,000+	15	3.22
Total	466	100%

According to the data analysis, the age distribution of the respondents shows an obvious trend of concentration. The respondents in the age group of 25 and 34 accounted for the highest proportion of respondents, reaching 40.34%, showing that the participation and activity of this age group are strong. Followed by 18-24 years old, the proportion is 21.03%, which also shows the attention of young people to this problem. The proportion of people aged 45 and above (45, 54 years old and over 55 years old) is relatively low, only 6.87% and 7.94%. This may indicate that the group is not paying enough attention to the relevant issues. In the sample participating in the survey, the proportion of urban and rural areas is almost equal, with cities accounting for 50.21% and rural areas accounting for 49.79%. The educational background of the respondents is mainly based on bachelor's degree and above, among which the proportion of undergraduate degrees is the highest, reaching 47.21%. The proportion of high school diplomas is 24.89%, showing that the number of respondents in basic education is relatively large. The proportion of respondents with master's and doctoral degrees is relatively low, at 20.6% and 7.3% respectively, indicating insufficient participation in high-level education. The incomes less than 2,000 for 28.76%, 2,000-3,999 the proportion is 22.75%, 4,000-5,999 the proportion of 6,000-7,999 accounting for 12.02%, 8,000-9,999 and 10,000+is very low, only 6.22% and 3.22%.

Variables Characteristics

Table 2 Summary of Descriptive Statistics of Key Variables (N=466)

Variable	Mean	S.D.	Meaning
Guarantee Systems	3.706	0.862	Agree
Regional Dynamics	3.707	0.941	Agree
Promoting Balanced Development	3.709	0.880	Agree
Total	3.707	0.893	Agree

The guarantee systems mean score of 3.706, with a standard deviation of 0.862, indicates that participants generally agree that the existing guarantee systems are effective, though there is some variation in responses. The regional dynamics mean score of 3.707, with a standard deviation of 0.941, suggests

a general agreement on the impact of regional dynamics on balanced development, with slightly more variability in responses compared to guarantee systems. The promoting balanced development mean score of 3.709, with a standard deviation of 0.880, also shows agreement on the progress of balanced development, with moderate variation. The overall mean of 3.707, with a standard deviation of 0.893, reflects a general agreement across all variables, with a similar degree of variability in responses across the three key areas of the study.

Reliability Analysis

The Cronbach's alpha coefficient is a well-established measure for evaluating the reliability of a scale. The values of this coefficient offer insights into how reliable respondents' answers are on that scale. A value greater than 0.8 indicates high reliability, values between 0.7 and 0.8 reflect good reliability, those from 0.6 to 0.7 suggest an acceptable level of reliability, while values below 0.6 indicate poor reliability.

Table 3 Cronbach's Alpha Results of Each Item of Questionnaire

Variable	Statement	Total Correlation (CITC)	Item deleted a Coefficient	Cronbach α Coefficient
Guarantee Systems	The current guarantee systems effectively provide educational resources in my area	0.624	0.928	0.936
	The guarantee systems address educational inequality in my region	0.672	0.927	
	The processes of guarantee systems are transparent and understandable	0.642	0.928	
	The guarantee systems are regularly updated to meet local educational needs	0.661	0.927	
	The financial support provided by the guarantee systems is adequate	0.663	0.927	
Regional Dynamic	The quality of education in my region is high	0.680	0.927	
	Socio-economic factors significantly affect education quality in my area	0.706	0.926	
	Geographical factors influence educational access in my region	0.680	0.927	
	Local governments understand and respond to educational challenges in my area	0.701	0.926	
	There is a significant difference in education quality between urban and rural areas	0.669	0.927	
Promoting Balanced Development	Community involvement is crucial for promoting educational equity.	0.629	0.928	
	Community actively participates in educational planning and decision-making.	0.666	0.927	
	There are effective mechanisms for Educational engagement in my community.	0.669	0.927	
	Community engagement leads to better educational outcomes.	0.669	0.927	
	Local educational policies reflect community needs and priorities.	0.636	0.928	

A Cronbach's alpha above 0.70 is generally considered acceptable, indicating that the survey items for each variable are reliably measuring the intended construct. The reliability analysis confirms

that the instruments used in this study to measure the effectiveness of guarantee systems, regional dynamics, and educational outcomes in compulsory education across Shaanxi Province are consistent and reliable. The high Cronbach alpha values suggest that the items in the survey are effectively capturing the intended constructs and thereby providing confidence in the robustness of the research findings.

Table 4 Reliability of Analysis of Variable (N=466)

Variable	Number of Items	Cronbach's Alpha	Overall Cronbach's Alpha
Guarantee Systems	5	0.804	0.936
Regional Dynamics	5	0.835	
Promoting Balanced Development	5	0.808	

Reliability in research refers to the consistency and stability of the measurement instruments used in a study. In the context of this research, assessing the reliability of the questionnaire used to gather data on guarantee systems, regional dynamics, and promoting balanced development is crucial to ensure that the results obtained are trustworthy and valid.

To evaluate the reliability of the questionnaire, Cronbach's Alpha is commonly used as a statistical measure. This coefficient indicates how well a set of items measures a single unidimensional latent construct. The values of Cronbach's Alpha range from 0 to 1, with higher values indicating greater internal consistency among the items.

Correlation Analysis

Table 5 Correlation Analysis (N=466)

	Guarantee Systems	Regional Dynamics	Promoting Balanced Development
Guarantee Systems	1	0.893	0.820
Regional Dynamics	0.893	1	0.832
Promoting Balanced Development	0.820	0.832	1

The correlation coefficient between guarantee systems and regional dynamics is 0.893, Indicting a strong positive relationship, significant at the 0.01 level. The correlation coefficient between regional dynamics and promoting balanced development is 0.832, showing a very strong positive relationship, also significant at the 0.01 level. The correlation coefficient between guarantee systems and promoting balanced development is 0.820, indicating a strong positive relationship at the 0.01 significance level.

Regression Analysis

Table 6 Hypothesis Test by Regression Analysis (N=466)

Variable	Regression weight	Beta Coefficient (β)	R^2	F-value	P- value	Result Hypothesis Supported
H1	RD-GS	0.803	0.704	1101.834	0.000	Accepted
H2	GS-PBD	0.828	0.672	951.491	0.000	Accepted
H3	RD-PBD	0.804	0.691	1039.581	0.000	Accepted

Note: *<0.05, ** <0.01; RD=Regional Dynamics, GS=Guarantee Systems, PBD=Promoting Balanced Development

From the above analysis, it can be seen that regional dynamics have a significant indirect impact on promoting balanced development through the guarantee system, and the guarantee system plays an indispensable mediating role in it. This shows that when formulating regional development policies, the government and society should give priority to how to promote balanced education by strengthening the guarantee system, especially in narrowing the urban-rural gap. The role of the guarantee system is crucial. In addition, although regional dynamics have a certain direct impact on the balanced development of education, the indirect impact of the guarantee system is more important and significant.

Conclusion

This study conducted an in-depth analysis of the balanced development system of compulsory education in Shaanxi Province, revealing significant differences between urban and rural educational resources, infrastructure, and teaching quality. These differences not only affect students' academic performance but also restrict their future development opportunities. The study highlights the importance of developing customized policies for the needs of different regions and provides practical policy recommendations to help narrow the education gap.

Although the study has obvious advantages in identifying educational inequality, its limitations cannot be ignored, including limited geographical scope, insufficient sample diversity, and time constraints for data collection, which may affect the general applicability of the research results. In addition, the research results provide important references for the formulation of local and regional education policies and encourage future researchers to further explore the long-term impact of educational equity.

The study also emphasizes the importance of community participation in education, and suggests that future education reforms should focus on strengthening the support system of families and communities to improve educational equity. Overall, this study not only reveals the current situation of compulsory education in Shaanxi Province but also provides valuable insights and directions for achieving educational equity and quality improvement, which will help achieve broader socioeconomic development goals.

Discussion

In the discussion section of this study, three hypotheses are explored, providing an in-depth analysis of the relationship between the research findings and educational equity.

Regional Dynamics have a Significant Impact on Guarantee Systems

The research findings indicate that regional dynamics significantly influence the effectiveness of educational guarantee systems. Specifically, disparities in educational resources, infrastructure, and teaching quality between urban and rural areas directly affect the realization of educational equity. The study suggests that the government should formulate targeted policies to improve educational conditions in rural and remote areas, including increasing financial support, enhancing school infrastructure, and improving teacher training quality. Additionally, the active participation and responsiveness of local governments are crucial for ensuring the effective operation of guarantee systems.

Guarantee Systems have a Significant Impact on Promoting Balanced Development

The study confirms that educational guarantee systems play a vital role in promoting balanced regional development. Effective policy support, financial investment, and the rational allocation of educational resources can significantly narrow the educational gap between urban and rural areas. The research recommends that the government strengthen the customization of guarantee systems to ensure that policies are adapted to the specific needs of different regions, particularly in resource-scarce areas. Furthermore, the importance of social support networks is emphasized, suggesting that enhancing family and community involvement can positively impact students' learning motivation and educational outcomes.

Regional Dynamics have a Significant Impact on Promoting Balanced Development

The research results reveal that regional dynamics, including socio-economic conditions, geographical factors, and local governance structures, significantly influence the promotion of balanced development. It is noted that economically developed regions typically allocate more educational resources, leading to higher educational quality and more balanced development. In contrast, rural areas face greater educational challenges due to geographical isolation & resource scarcity. Therefore, policymakers should focus on these dynamic factors by implementing measures such as infrastructure development, financial subsidies, and educational reforms to address regional disparities and promote educational equity. Additionally, historical and cultural factors also contribute to educational gaps between regions, and policies should consider these deeper issues to achieve comprehensive educational equity.

In summary, the study emphasizes that addressing educational inequality requires multi-party collaboration, including the joint efforts of government, educational institutions, communities, and families. Through policy reform, resource redistribution, and community participation, Shaanxi Province can move towards achieving a more equitable and high-quality education system. Future research could further explore the long-term effects of these interventions and the applicability of different policies across regions to provide more comprehensive solutions for educational equity.

Recommendations

Based on the research results, a series of comprehensive measures are recommended to improve the equity of education in Shaanxi Province. First, it is crucial to improve the quality of education services, especially in resource-poor rural areas. Financial support for infrastructure construction and teacher training should be increased to ensure the improvement of education quality. Second, ensuring the fair distribution of educational resources is key. Customized support plans should be formulated according to the specific needs of different regions, especially for low-income and rural schools.

In addition, strengthening the construction of the security system cannot be ignored. It is recommended to establish a policy support and resource allocation framework that adapts to local conditions and implements an effective monitoring and evaluation mechanism to ensure the effectiveness and adaptability of policies. At the same time, promoting community and family participation is an important part of improving the quality of education. Encouraging community organizations and parents to actively participate in educational activities can enhance students' learning motivation and academic achievement.

In terms of addressing socioeconomic factors, providing financial assistance and scholarships will help reduce the burden on low-income families and ensure that every child can receive a good education. In addition, longitudinal research and comparative analysis are recommended to identify best practices and gain a deeper understanding of the impact of sociocultural factors on educational outcomes. These comprehensive measures will help narrow the education gap, promote educational equity in Shaanxi Province, and ensure that all students can receive high-quality education, thereby laying a solid foundation for their future development.

Research Contribution

The theoretical contribution of this study in the field of educational equity is mainly reflected in the expansion of educational equity theory and the in-depth exploration of the complex relationship between regional differences, socioeconomic factors and educational outcomes, especially in the context of Shaanxi Province, a developing region. By establishing a comprehensive model, the study identified multiple factors that affect educational quality, provided a theoretical framework for future research, and enriched the academic discussion of educational equity.

At the practical level, the research results have important application value and can have a positive impact at multiple levels. First, at the school level, educational institutions can use the research findings to design targeted interventions to meet the specific needs of disadvantaged students and improve their learning motivation and academic performance. Second, at the organizational level, non-governmental organizations and educational institutions can create effective support systems based on the research results, promote cooperation between schools and communities, and enhance the sharing of educational resources.

At the industry level, the education industry can use the research results to develop innovative products and services to meet the educational needs of underdeveloped regions and promote the realization of educational equity.

Finally, for policymakers, the research provides evidence-based policy recommendations to help them formulate policies that prioritize regional equity and improved educational outcomes. In practical policy recommendations for local governments and education management departments, the goal is to reduce regional educational inequality and increase the effectiveness of the guarantee system, as well as to promote policy improvement and execution. advancing Education Reform, the policymaker

highlights the importance of allocating educational resources and designing the guarantee system, and serves as a valuable resource for advancing educational reform in China and even the entire country.

In addition, this study is closely related to the Sustainable Development Goals (SDGs), especially Goal 4 (quality education), Goal 10 (reduced inequalities), Goal 8 (decent work and economic growth), and Goal 17 (partnerships for the goals). By identifying education gaps and proposing feasible solutions, the study aims to promote the realization of a more equitable and sustainable education system and contribute to the socio-economic development of Shaanxi Province and other regions.

Further Research

The exploration of educational equity and the effectiveness of guarantee systems in various regions presents numerous avenues for further investigation. Future studies could focus on longitudinal analyses to assess the long-term impacts of these systems on educational outcomes.

Additionally, qualitative research methods, such as interviews and focus groups, could provide deeper insights into the experiences of stakeholders involved in the educational process. This would help to understand the nuances of community engagement and its effects on educational policies.

Another area for exploration could be the comparative analysis of different regions to identify best practices and successful strategies in addressing educational inequalities. Such studies could inform policymakers and educators on effective interventions.

Furthermore, the integration of technology in educational systems and its role in enhancing access and quality of education warrants further examination. Understanding how digital tools can bridge gaps in educational access could be pivotal in shaping future educational frameworks.

Lastly, the impact of socio-economic and geographical factors on educational equity should be continuously monitored, as these elements are dynamic and can significantly influence educational outcomes over time.

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