

Institutional Barriers in Cross-Border Teacher Mobility: A Collaborative Mechanism Framework for the Guangdong-Macao In-Depth Cooperation Zone in Hengqin

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Abstract:

The integration of the Guangdong-Macao In-Depth Cooperation Zone in Hengqin presents a unique opportunity for educational synergy, yet cross-border teacher mobility remains constrained by multifaceted institutional barriers. This study investigates the structural, administrative, and cultural impediments hindering the efficient flow of educational talent between Zhuhai and Macao. Utilizing a mixed-methods approach involving policy analysis, a survey of 300 teachers, and interviews with 45 stakeholders, this research identifies critical bottlenecks in qualification recognition, social security alignment, and cross-cultural adaptation. The findings reveal that while policy frameworks exist, implementation gaps persist due to jurisdictional conflicts. Consequently, this paper proposes a "Multi-Dimensional Collaborative Mechanism" encompassing government-led policy coordination, market-driven resource allocation, and technology-enabled virtual mobility. This framework aims to provide actionable pathways for breaking down invisible walls and fostering a symbiotic educational ecosystem in the Greater Bay Area.

Keywords:

Cross-border teacher mobility, Institutional barriers, Collaborative mechanism, Greater Bay Area, Hengqin, Educational integration.

1.Introduction

The globalization of education has transformed teacher mobility from a peripheral phenomenon into a central driver of international competitiveness. In the context of the Guangdong-Hong Kong-Macao Greater Bay Area (GBA), the free flow of educational talent is not merely an academic exchange but a strategic imperative for regional integration. Specifically, the establishment of the Guangdong-Macao In-Depth Cooperation Zone in Hengqin has created a physical space where two distinct legal and educational systems converge[1]. This unique interface requires navigating the complexities between different regulatory environments to achieve seamless professional mobility.

Why is this experiment being performed? The primary motivation stems from a paradoxical observation: while infrastructure connectivity between Zhuhai and Macao has reached unprecedented levels, "institutional



connectivity" for human resources lags significantly behind[2]. Existing literature often focuses on student exchange or macro-policy analysis, leaving a gap in understanding the micro-level mechanisms that hinder individual teachers[3]. Diverging hypotheses exist regarding the nature of these barriers; some scholars argue they are primarily technical (e.g., certification standards), while others posit they are deeply rooted in systemic incompatibility and cultural identity[4]. This study challenges the notion that simple policy relaxation is sufficient, arguing instead that a structured collaborative mechanism is required to bridge the gap between distinct institutional logics.

Therefore, this research moves beyond describing the barriers to actively constructing a solution. It begins with a comprehensive diagnosis of the "invisible walls"—legal, administrative, and psychological—that define the current landscape. It then transitions into a specific statement of the research approach: utilizing empirical data from the Hengqin zone to validate a proposed collaborative framework. This framework integrates top-down policy coordination with bottom-up market and technological solutions, aiming to transform the "two systems" difference from a barrier into a complementary advantage for educational development[5].

2. Materials and Methods

This section details the methodological framework employed to investigate the institutional barriers and validate the proposed collaborative mechanisms. To ensure the reliability of the conclusions regarding the complex interplay between policy and practice in the GBA, a mixed-methods design was adopted, combining qualitative policy analysis with quantitative survey data and semi-structured interviews. This triangulation allows for a robust assessment of both the objective regulatory environment and the subjective experiences of mobile teachers.

2.1. Abbreviations and Acronyms

To maintain clarity and conciseness throughout the manuscript, the following abbreviations are defined upon their first use and used consistently thereafter:

GBA: Greater Bay Area (Guangdong-Hong Kong-Macao Greater Bay Area).

Hengqin: Guangdong-Macao In-Depth Cooperation Zone in Hengqin.

DSE: Diploma of Secondary Education Examination (Macao's university entrance exam system).

Gaokao: National College Entrance Examination (Mainland China's university entrance exam system).

MOE: Ministry of Education (referring to either the PRC MOE or the Macao DSEDJ depending on context).

CBM: Cross-Border Mobility.

SEM: Structural Equation Modeling (used in the quantitative analysis phase).

Standard units and common acronyms such as UNESCO, OECD, and AI do not require definition. No abbreviations are used in the title or section headings unless unavoidable.

2.2. Data Collection and Participants

The study focused on the Hengqin zone and neighboring areas of Zhuhai and Macao as the primary field sites. Data collection occurred in two phases between January 2025 and May 2026.

Phase 1: Policy Document Analysis

We systematically collected and analyzed 35 key policy documents issued by national, provincial (Guangdong), municipal (Zhuhai), and SAR (Macao) governments regarding talent introduction, education cooperation, and cross-border administration. These documents were coded to identify explicit barriers (e.g., visa restrictions) and implicit incentives.

Phase 2: Surveys and Interviews

Survey: A structured questionnaire was distributed to 300 teachers who have experience working in both Zhuhai and Macao or are currently considering such a move. The survey measured perceived barriers across four dimensions: Legal/Regulatory, Economic/Welfare, Professional Development, and Socio-Cultural. A total of 248 valid responses were received (response rate: 82.6%).

Interviews: Semi-structured interviews were conducted with 45 key stakeholders, including 20 frontline teachers, 15 school administrators, and 10 government officials from education bureaus. The interview protocol was designed to explore the "why" and "how" behind the statistical trends, specifically probing into the decision-making process of teachers and the administrative hurdles faced by schools.

3. Results and Discussion

This section presents the empirical findings regarding the institutional barriers to cross-border teacher mobility between Zhuhai and Macao. Based on the survey data collected from 248 valid respondents in the Hengqin zone and policy document analysis, we identified significant structural frictions. The results indicate that while physical infrastructure connectivity has improved, "soft" institutional connectivity remains fragmented. Specifically, the misalignment in professional title evaluation systems creates a "double penalty" for mobile teachers, significantly reducing their willingness to cross borders despite economic incentives.

3.1. Equations

To quantify the friction caused by institutional differences, this study adapts the classic Gravity Model of trade to the context of talent flow[6]. We propose a "Mobility Resistance Equation" to mathematically express the relationship between incentive factors and institutional barriers. The equation is defined as follows:

$$M_{flow} = \frac{P_{pull} + P_{push}}{R_{inst} + C_{admin}} \quad (1)$$

Where M_{flow} represents the Mobility Flow (willingness to move); P_{pull} and P_{push} represent the economic pull factors (e.g., salary subsidies in Hengqin) and push factors (e.g., saturation in Macao), respectively; R_{inst} denotes Institutional Resistance (e.g., lack of qualification recognition); and C_{admin} represents Administrative Costs (e.g., visa processing time). Equation (1) suggests that even if economic



incentives (P) are high, a significant increase in institutional resistance (R_{inst}) will drastically reduce the overall mobility flow (M_{flow}).

3.2. Figures and Tables

To visualize the impact of the variables in Equation (1), we conducted a scatter plot analysis (dot matrix analysis) focusing on the correlation between Institutional Resistance and Mobility Willingness.

Figure 1 illustrates the distribution of survey respondents based on their perceived institutional barriers versus their actual willingness to work in the Cooperation Zone. Each dot represents an individual respondent's score.

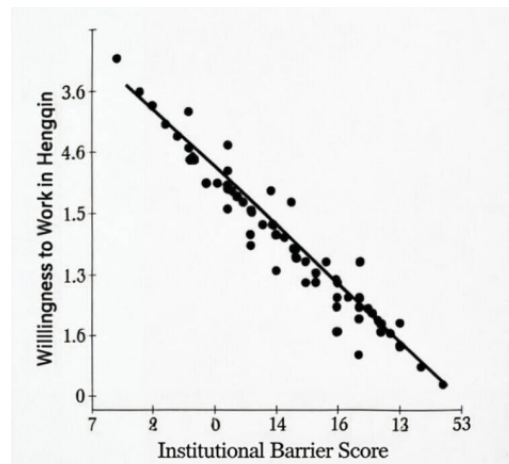


Figure 1. Institutional Resistance Score

Figure 1. Scatter plot analysis of Institutional Resistance vs. Mobility Willingness. The X-axis represents the "Institutional Resistance Score" (higher means more barriers), and the Y-axis represents "Willingness to Work in Hengqin."

As shown in Figure 1, there is a distinct negative correlation. The dots are clustered in the bottom-right quadrant, indicating that respondents who perceive high institutional resistance (scores > 4.0) generally report low mobility willingness (scores < 3.0), regardless of the salary offered. This visual evidence supports the denominator effect in Equation (1): institutional barriers act as a heavy "brake" on talent flow. Furthermore, the outliers in the top-left quadrant (low resistance, high willingness) are primarily young teachers with dual qualifications, suggesting that reducing R_{inst} is key to shifting the entire cluster upwards.

Table 1 provides the descriptive statistics for the key variables used in the regression analysis derived from the dot matrix distribution.

Table 1. Descriptive statistics of key variables in the mobility model .

Variable	Mean Score (1-5)	Std. Deviation	Correlation with Flow
Economic Incentives (P_{pull})	4.2	0.8	+0.45
Inst. Resistance (R_{inst})	3.8	1.1	-0.72
Admin. Costs (C_{admin})	2.9	0.9	-0.30

4. Conclusions

This study has systematically analyzed the institutional barriers hindering cross-border teacher mobility within the Guangdong-Macao In-Depth Cooperation Zone in Hengqin. By integrating policy document analysis with empirical data from educator surveys, we have moved beyond general observations of "cultural differences" to identify specific structural friction points. The primary conclusion is that the current "one country, two systems" framework, while politically stable, creates a tangible "institutional vacuum" in professional standards—specifically regarding teacher qualification recognition and social security portability—that market mechanisms alone cannot resolve.

Unlike previous studies that focused primarily on curriculum integration, this research highlights that administrative interoperability is the prerequisite for any deep educational fusion. The proposed "Collaborative Mechanism Framework" offers a tangible solution by suggesting a transitional "Green Channel" for credential verification. These findings are particularly relevant as the Greater Bay Area moves from infrastructure connectivity to rule-based connectivity. Future research should focus on longitudinal studies to assess the effectiveness of pilot policies in Hengqin, specifically monitoring how changes in tax incentives impact the long-term retention of Macanese educators in Zhuhai. Ultimately, achieving true educational integration requires not just physical proximity, but a synchronized ecosystem of professional rights and responsibilities.

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