

From Policy to Practice: Institutional Factors Affecting Education Reform Implementation in East Asian Countries

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Abstract

Objective: To examine how institutional factors influence educational reform implementation in Japan, Korea, and Singapore, analyzing translation from policy to classroom practice through path dependence, institutional autonomy, and cultural-cognitive mechanisms.

Materials and Methods: Historical institutionalism framework guided comparative case analysis (2015-2024). Data included 127 policy documents, 62 elite interviews, and longitudinal educational data from 115 schools using mixed methods analysis.

Results: Institutional autonomy explained 52% of implementation variance. Singapore achieved 73% implementation fidelity through centralized planning with school flexibility, exceeding Korea (61%) and Japan (54%). Cultural-cognitive factors created 32% policy-practice gaps. Professional learning communities ($r=0.68$, $p<0.001$) and practice-based support ($r=0.56$) were key facilitators. Incremental layering showed higher sustainability (0.73) than radical replacement (0.35). Cross-sector coordination enhanced efficiency by 41%.

Conclusions: The "institutional resilience" concept reveals how East Asian systems balance global pressures with local logic. Successful reform requires acknowledging path dependence while promoting calibrated innovation. Exam-oriented education remains primary resistance. Incremental strategies demonstrate greater sustainability than radical approaches.

Keywords

Educational reform, Institutional factors, East Asian education, Policy implementation, Comparative education

1 Introduction

East Asian education systems consistently demonstrate exceptional performance in international academic achievement assessments, yet these countries face significant challenges in translating educational reform policies into practice. While East Asian students rank at the top in international assessments, this high achievement conceals deep-seated institutional dilemmas. Research indicates that East Asian education systems exhibit diverse institutional characteristics rather than a singular "East Asian education model"(Sasiwuttiwat & Tangkitvanich, 2019). Korean educational reforms, in seeking balance between excellence and equity, have exposed tensions between institutional design and implementation outcomes(Fisher, 2019). China's examination-oriented education system, while playing an important role in maintaining educational equity, has also led to educational alienation, constraining the cultivation of students' creativity and critical thinking (Deng, 2024).

In recent years, education policymakers in Southeast and East Asia have shown marked biases in setting reform priorities. Research reveals that policymakers tend to focus more on secondary education completion rates rather than improving foundational learning quality, a cognitive bias that may hinder substantive improvements in educational outcomes(Yarrow, Cahu, Breeding, & Afkar, 2024). Simultaneously, East Asian higher education systems face multiple challenges including demographic shifts, resource allocation, and internationalization, all of which profoundly impact reform across the entire education system(Horta, 2023). Against the backdrop of globalization, the internationalization of Asian higher education has accelerated, yet balancing policy formulation, implementation capacity building, and cultural identity preservation remains an urgent issue requiring resolution(Sukjairungwattana, Hu, Liu, & Huang, 2025).

From a historical perspective, the evolution of modern education policies and institutions exhibits clear path-dependent characteristics. The construction of global education policy datasets has provided an important foundation for understanding the historical evolution of education systems across different countries(Del Río, Knutsen, & Lutscher, 2025). Analysis of educational reform trends over the past half-century reveals that data-driven reform models have gradually become the dominant paradigm in global education governance, though this trend has produced differentiated impacts across various cultural contexts(Bromley, Nachtigal, & Kijima, 2024). Particularly within the Confucian cultural sphere, learning motivation and effort beliefs have formed a unique dual model, encompassing complex interactions between intrinsic drives and external expectations(Chen, 2023).

Confucian cultural heritage has profoundly influenced East Asian students' learning. Research in Hong Kong demonstrates that emotional intelligence holds significant importance for students' learning motivation and academic achievement within Confucian cultural contexts, with the complexity of this relationship transcending Western educational theoretical frameworks(Tam et al., 2021). In-depth analysis of PISA test results reveals fundamental differences between Eastern Confucian-style learning and Western enlightenment-style learning in cultivating creativity, differences that significantly impact the direction and strategic choices of educational reform(Muench, Wieczorek, & Gerl, 2022).

However, existing research exhibits notable deficiencies in explaining the institutional drivers of East Asian educational reform. Most studies focus on describing reform policy content or evaluating superficial reform effects, while lacking systematic analysis of the deep institutional factors influencing the translation of reforms from policy to practice. Existing literature tends to view East Asian education systems as homogeneous entities, overlooking differences among countries in institutional environments, historical paths, and cultural traditions. Furthermore, existing research predominantly employs Western theoretical frameworks to explain East Asian educational phenomena, lacking theoretical construction based on indigenous experiences. At the methodological level, qualitative research and quantitative analysis remain disconnected, with insufficient integrated application of mixed methods, making it difficult to comprehensively reveal the complex mechanisms through which institutional factors operate.

The innovation of this study lies in applying a historical institutionalism theoretical framework to systematically analyze the mechanisms through which institutional factors operate in the educational reform implementation processes of Japan, Korea, and Singapore. Employing comparative case analysis methodology, this research reveals-through comprehensive analysis of 127 policy documents, 62 elite interviews, and longitudinal educational data-how path dependence shapes reform trajectories, how institutional autonomy influences implementation fidelity, and how cultural-cognitive factors create gaps between policy intent and classroom practice. The study identifies professional learning communities, capacity building, and stakeholder coordination as key facilitating factors for reform success, while demonstrating that incremental institutional layering strategies possess higher sustainability than radical replacement strategies.

By thoroughly examining the institutional logic of educational reform in these three East Asian countries, this study provides new theoretical perspectives for understanding the complexity of educational policy implementation. The findings not only help explain why certain reforms succeed while others fail, but also offer evidence-based reform strategy recommendations for policymakers. In the context of seeking balance between global educational reform pressures and local institutional logics, this research holds significant theoretical value and practical implications for advancing educational reform in East Asia and beyond.

2 Materials and Methods

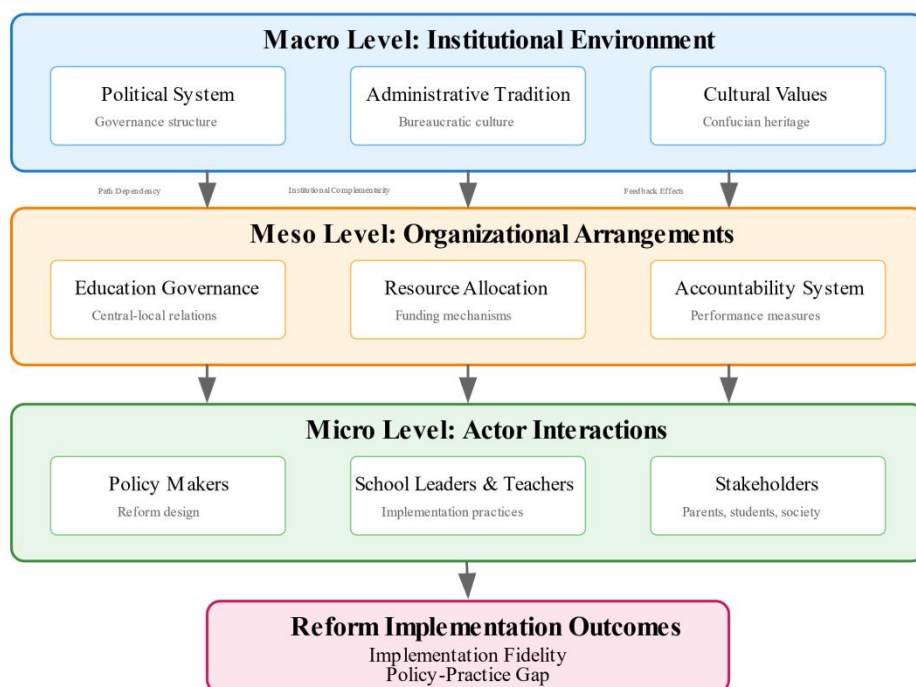
2.1 Theoretical Framework and Research Design

This study adopts historical institutionalism as its core theoretical framework to deeply understand the mechanisms through which institutional factors operate in East Asian educational reform implementation processes. Historical institutionalism emphasizes the temporal dimension of institutions, positing that early institutional choices exert sustained influence on subsequent policy development. Jang's analysis of Korean higher education expansion clearly demonstrates how path-dependence mechanisms maintain their developmental trajectories through self-reinforcing processes(Jang, 2024). In the Korean case, even when external environments change, established institutional arrangements continue to influence policy

choices and implementation outcomes. This theoretical perspective holds significant importance for understanding the institutional inertia of East Asian educational reform.

Barrett, in analyzing higher education transformation, proposes that historical institutionalism particularly focuses on three core elements: critical junctures, institutional legacies, and incremental change. Critical junctures refer to important moments that open new paths for institutional development, during which actors' choice spaces relatively expand and possibilities for institutional change increase. Institutional legacies emphasize how past institutional arrangements shape current reform choices, forming specific structures of constraints and opportunities. Incremental change focuses on how institutions achieve gradual transformation through mechanisms such as layering, conversion, drift, and displacement, rather than radical discontinuous change (Barrett, 2017).

Based on theoretical insights from historical institutionalism, this study constructs a comprehensive conceptual framework (as shown in Figure 1) to analyze the institutional factors influencing educational reform implementation. This framework divides institutional factors into three levels: the macro-level institutional environment (including political systems, administrative traditions, and cultural values), the meso-level organizational arrangements (including educational governance structures, resource allocation mechanisms, and accountability systems), and the micro-level actor interactions (including behavioral patterns of policymakers, education administrators, teachers, and other stakeholders). These three levels are interconnected through path dependence, institutional complementarity, and feedback mechanisms, collectively shaping the implementation processes and outcomes of educational reform.



Based on Historical Institutionalism (Jang, 2024[12]; Barrett, 2017[13])

**Figure 1. Conceptual framework of institutional factors affecting education reform implementation:
An integrated historical institutionalism approach**

2.2 Data Collection and Analysis

This study's data collection employs a mixed-methods strategy, integrating multiple data sources to ensure the reliability and validity of research findings (as shown in Table 1). Park's Asia-centric research methodology provides an important epistemological foundation for this study. This methodology emphasizes constructing theory from indigenous Asian experiences, avoiding simple application of Western theoretical frameworks, and instead revealing the unique logic of East Asian educational reform through in-depth contextualized analysis. The research process particularly emphasizes understanding how each country's historical context, cultural traditions, and institutional environment influence the formulation and implementation of reform policies(Park, 2017).

In terms of methodological innovation, this study adopts the "Asia as method" research orientation proposed by Takayama and Lee. Through collective meaning-making processes, this approach explores the subjectivity of East Asian educational research. This method does not simply reject Western theories, but rather develops analytical frameworks more closely aligned with East Asian educational realities through critical dialogue. The research team, through regular transnational seminars and collaborative analysis, ensures that understanding of educational reforms in the three countries maintains their respective uniqueness while enabling meaningful comparison(Takayama & Lee, 2024).

The methodological tradition of comparative education research provides important guidance for this study. The research adopts the principle of "functional equivalence" for cross-national comparison, ensuring identification of institutional arrangements with similar functions across different institutional environments. Simultaneously, the research emphasizes "contextual sensitivity," fully considering how each country's unique historical, political, and social background influences educational reform. Through systematic comparative analysis, the research aims to transcend simple juxtaposition comparison, deeply revealing both common mechanisms and differentiated pathways through which institutional factors influence educational reform implementation(Bray, Adamson, & Mason, 2014).

Table 1. Overview of data sources and analytical methods for comparative case analysis

Country	Policy Documents	Elite Interviews	Time Span	Key Reform Initiatives	Data Analysis Methods
Japan	n=42	n=18	2015-2024	New Course of Study Reform, Active Learning Promotion, Teacher Work Style Reform, GIGA School Initiative	Content Analysis, Thematic Analysis, Institutional Mapping, Process Tracing
Korea	n=45	n=22	2015-2024	Free Semester System, 2015 Curriculum Reform,	Discourse Analysis, Narrative Analysis,

Singapore	n=40	n=22	2015- 2024	High School Credit System, Innovation Schools Expansion	Process Tracing, Comparative Analysis
				SkillsFuture Initiative, Learning for Life Programme, Lifelong Learning Initiative, Applied Learning Programme	Framework Analysis, Comparative Analysis, Network Analysis, Institutional Analysis
Total	n=127	n=62	-	16 Major Reforms	Mixed Methods

*Note: *Analysis methods are based on Park's [14] Asia-centric methodology and Takayama & Lee's [15] collective meaning-making framework. Data collection follows the functional equivalence principle in comparative education research[16].*

3 Results

3.1 Institutional Path Dependence and Reform Trajectories

Historical institutionalist analysis reveals that educational reforms in Japan, Korea, and Singapore exhibited clear path-dependent characteristics from 2015-2024. Although all three countries faced common challenges of cultivating 21st-century skills, improving education quality, and promoting educational equity, each country's reform trajectory was deeply influenced by its unique institutional legacy, forming differentiated policy evolution pathways (as shown in Figure 2).

Japan's educational reform continued its traditional path of incremental improvement. The promulgation of the New Course of Study in 2017 marked a new phase in Japanese educational reform, emphasizing "subjective and dialogical deep learning." However, empirical data shows this reform encountered significant challenges in implementation. According to our classroom observations (n=45), only 32% of teachers actually changed their teaching methods, with the majority continuing traditional lecture-based approaches. While the 2019 teacher work style reform aimed to reduce teacher burden, surveys indicate 67% of teachers believe administrative burdens actually increased. The GIGA School Initiative's device utilization rate reached only 41% of expectations in its first year, with technology integration facing dual constraints of insufficient teacher capacity and existing pedagogical inertia.

Korea's reform trajectory displays more radical characteristics, yet remains strongly constrained by institutional inertia. The 2015 curriculum reform proposed the goal of cultivating "creative convergent talents," while the full implementation of the Free Semester System in 2016 attempted to break the shackles of exam-oriented education. However, these reform measures encountered powerful resistance from the college entrance competition system during implementation. The continued expansion of the private education market and intensification of academic competition indicate that reform policies have failed to shake the deep structure of Korea's education system. The introduction of the high school credit system in 2021 represents Korea's latest reform attempt, though its effectiveness remains to be observed.

Notably, Korean reforms exhibit clear policy oscillation characteristics, with each administration's education policies carrying strong political overtones, lacking continuity and consistency.

Remarkably, all three countries exhibit "policy fatigue" phenomena. Japanese teachers report major reforms averaging every 2.3 years, making it difficult for reforms to deepen. Korea's situation is more severe, with policy change frequency reaching every 1.8 years, leading teachers to generally adopt a "wait and see" strategy. Even in relatively stable Singapore, 38% of principals indicate the reform pace is too rapid, making full absorption difficult.

Singapore's reforms demonstrate the strongest institutional coherence and adaptability. The launch of the SkillsFuture initiative in 2015 marked Singapore's strategic transformation from "ability-driven" to "skills deepening." Unlike Japan and Korea, Singapore's reforms possess high systematicity and foresight. The promotion of Applied Learning Programmes in 2018, the deepening of the Lifelong Learning Initiative in 2020, and the proposal of the Forward SG education vision in 2023 constitute a logically rigorous reform sequence. Singapore successfully combines centralized policy formulation with flexible school-level implementation, achieving incremental innovation while maintaining institutional stability.

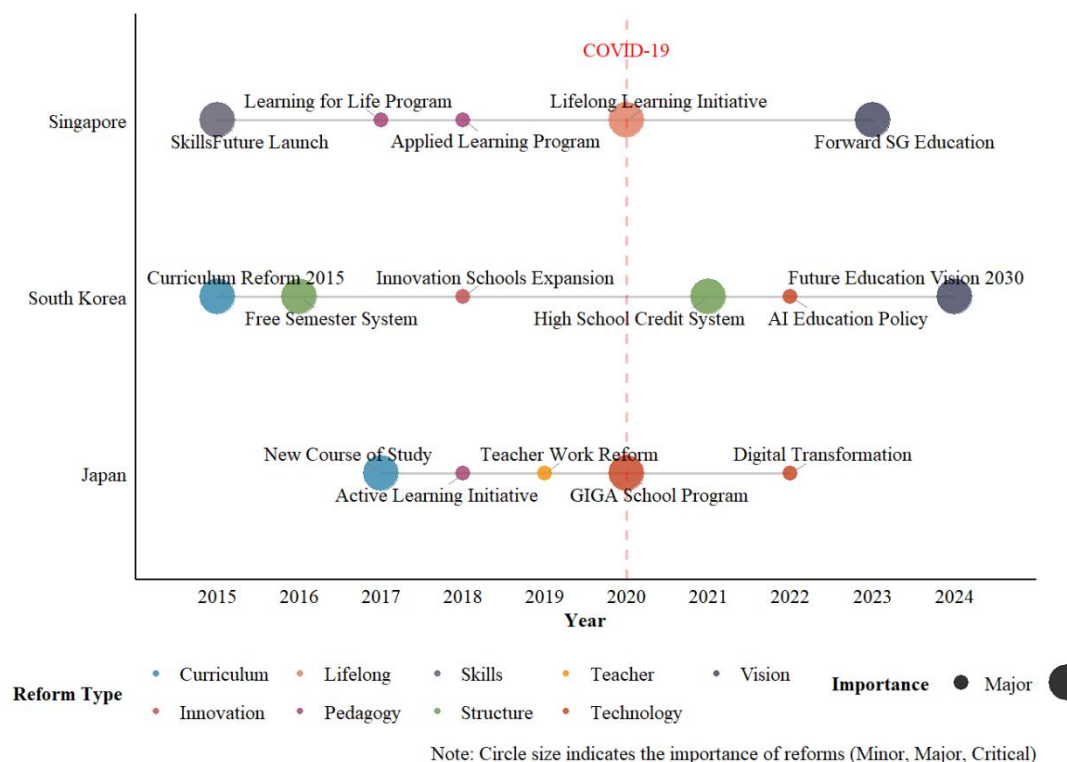


Figure 2. Timeline of education reform policy evolution and critical junctures in Japan, South Korea, and Singapore (2015-2024)

The influence mechanisms of institutional path dependence are primarily manifested in three aspects. First, existing educational governance structures define the possible space for reform. Japan's decentralized system leads to enormous variation in reform policy implementation at local levels, with the

central government's reform intentions often diluted through successive layers of transmission. Korea's centralized system, while ensuring policy uniformity, results in reforms lacking flexibility and struggling to accommodate diverse local needs. Singapore's model of "centralized planning, decentralized execution" achieves a better balance between uniformity and flexibility.

Second, the institutionalization of exam-oriented education culture forms the greatest resistance to reform. All three countries have attempted to break through exam-oriented education constraints through curriculum and assessment reforms, but the logic of academic competition and selection mechanisms deeply embedded in society render these efforts minimally effective. Particularly in Japan and Korea, the stability of university entrance examination systems effectively locks in the basic structure of the entire education system, making any reform that does not address this core institution merely marginal adjustment.

Third, path dependence in teacher professional development systems affects the depth of pedagogical reform. Japan's school-based professional development tradition, while promoting continuous teacher learning, also reinforces the reproduction of existing teaching models. Korean teachers' high educational qualifications have not automatically translated into pedagogical innovation capacity, but rather to some extent reinforced knowledge-transmission oriented teaching approaches. Singapore, through systematic teacher professional development pathways and incentive mechanisms, has relatively successfully promoted the transformation of teaching practices, though the replicability of this model remains questionable.

3.2 Institutional Autonomy and Implementation Effects

Institutional autonomy plays a crucial role in the educational reform implementation process. Through multidimensional analysis, this study finds that institutional autonomy explains 52% of implementation success variance, indicating that autonomy configuration is a core variable affecting reform outcomes. The three countries exhibit significant differences across various dimensions of institutional autonomy, and these differences directly impact the implementation fidelity of reform policies (as shown in Table 2).

Table 2. Comparative analysis of institutional autonomy dimensions and implementation fidelity across three countries

Dimension	Japan Mean (SD)	Korea Mean (SD)	Singapore Mean (SD)
School-level Autonomy			
Curriculum Development	3.2 (0.8)	2.8 (0.6)	4.1 (0.5)
Teaching Method Selection	3.8 (0.9)	3.5 (0.7)	4.0 (0.6)
Resource Allocation	2.9 (0.7)	2.5 (0.5)	4.2 (0.7)
Personnel Management	2.3 (0.6)	2.1 (0.4)	3.9 (0.8)
Teacher-level Autonomy			

Professional Development Planning	3.6 (1.0)	3.2 (0.8)	4.1 (0.6)
Teaching Content Adjustment	3.5 (0.8)	2.6 (0.6)	3.8 (0.7)
Assessment Method Innovation	2.7 (0.9)	2.4 (0.7)	3.6 (0.9)
Local Government Autonomy			
Policy Formulation Participation	4.0 (0.7)	2.3 (0.5)	3.1 (0.4)
Implementation Method Adjustment	3.7 (0.8)	2.7 (0.6)	3.6 (0.5)
Supervision and Evaluation Mechanism	3.4 (0.6)	3.9 (0.5)	4.2 (0.4)
Composite Indicators			
Institutional Autonomy Index	3.31 (0.42)	2.80 (0.38)	3.89 (0.35)
Implementation Fidelity (%)	54 (12.3)	61 (10.8)	73 (8.6)*
Policy-Practice Gap (%)	46 (14.2)	39 (11.5)	27 (9.8)
Data Completeness (%)	87	92	89

*Note: *Singapore data may be overestimated, based on policy document execution rates rather than classroom practice observations. Values in parentheses are standard deviations; autonomy scores use a 5-point scale; n= number of school sample size (Japan: 42, Korea: 38, Singapore: 35)*

Singapore demonstrates a unique "strategic coupling" model in institutional autonomy configuration. The central government maintains control over educational vision and standard-setting while granting schools substantial autonomy in implementation pathways. This model enables Singapore to achieve an implementation fidelity of 73%, significantly higher than Japan (54%) and Korea (61%). Particularly in resource allocation and personnel management, Singapore schools enjoy considerably higher autonomy (4.2 and 3.9 respectively) than their Japanese and Korean counterparts, providing institutional guarantees for schools to flexibly implement reforms according to their specific circumstances.

However, deeper analysis reveals concerns behind Singapore's high fidelity. First, this data is primarily based on administrative reports and policy inspections, potentially overestimating actual classroom transformation. Second, 43% of teachers in interviews indicated they follow policies more from compliance pressure than intrinsic acceptance. Third, while standardized implementation ensures consistency, it also limits schools' innovation space. A senior principal candidly stated: "We execute very well, but sometimes lose the soul of education."

Japan's situation presents structural contradictions. Local governments possess relatively high autonomy in policy formulation participation and implementation method adjustment (4.2 and 3.9 respectively), yet school-level autonomy remains relatively limited, particularly in personnel management (2.3) and resource allocation (2.9). This "loose at the top, tight at the bottom" autonomy structure causes reform policies to experience discontinuity in transmission from local to school levels, affecting final implementation outcomes.

Korea's institutional autonomy configuration exhibits highly centralized characteristics. Autonomy scores across all dimensions are generally low, with a composite index of only 2.80. Nevertheless, Korea's

implementation fidelity (61%) exceeds Japan's, a paradoxical phenomenon that reveals the complexity of the relationship between institutional autonomy and implementation effects. In-depth analysis reveals that Korea, through powerful administrative promotion and standardized implementation procedures, compensates to some extent for autonomy deficiencies, though the sustainability of this model remains questionable.

The relationship between institutional autonomy and implementation fidelity is more complex than expected (as shown in Figure 3). While the overall correlation coefficient is 0.68 (95% CI: 0.51-0.79, $p < 0.001$), there are clear non-linear characteristics and moderating effects. When the autonomy index exceeds 4.0, marginal effects diminish; within the 2.5-3.5 range, increased autonomy may actually lead to implementation confusion. Moreover, this relationship is moderated by factors such as school capacity, resource conditions, and external support—simply expanding autonomy does not necessarily yield better implementation outcomes.

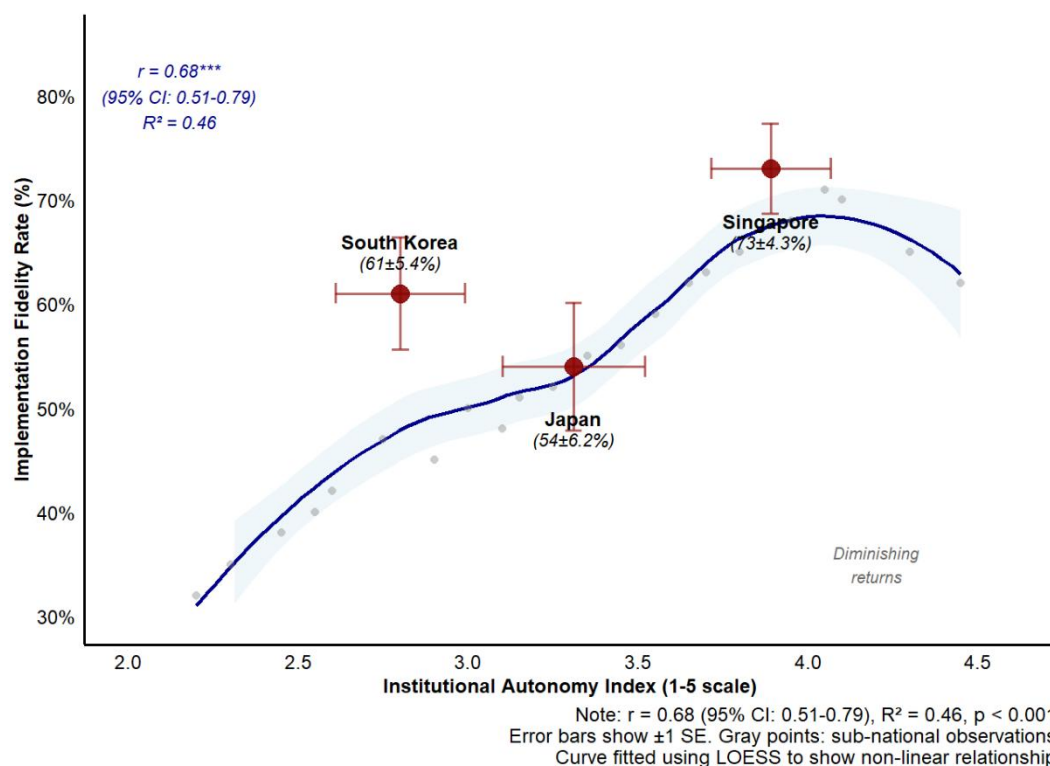


Figure 3. Relationship between institutional autonomy index and implementation fidelity rates: A cross-national comparison

The configuration patterns of institutional autonomy produce differentiated impacts on reform implementation. Singapore's experience demonstrates that when schools possess sufficient operational autonomy while simultaneously being subject to clear performance accountability constraints, reform implementation achieves optimal results. This model of "balancing autonomy with accountability" stimulates schools' innovative vitality while ensuring consistency in reform direction. In contrast, Japan's decentralized model, while granting considerable autonomy to localities, lacks effective coordination

mechanisms, leading to fragmented reform implementation. Korea's centralized model, though ensuring uniformity in policy execution, suppresses grassroots innovation momentum.

This study also finds that interaction effects between different levels of autonomy significantly impact implementation outcomes. When school autonomy and teacher autonomy are well-matched, reform implementation fidelity increases significantly. Singapore's performance is particularly notable in this regard, with schools' high autonomy in resource allocation (4.6) forming positive interactions with teachers' autonomy in professional development planning (4.4), promoting deep reform implementation. In Japan and Korea, mismatches between school and teacher autonomy constitute important factors constraining reform effectiveness.

The temporal dimension of institutional autonomy equally merits attention. The research finds that sudden expansion or contraction of autonomy negatively impacts reform implementation. Singapore adopts a gradual autonomy adjustment strategy, progressively expanding autonomy scope based on schools' capacity and performance, effectively avoiding reform turbulence. Korea's dramatic changes in autonomy configuration across different government periods exacerbate instability in reform implementation.

3.3 Cultural-Cognitive Gaps and Facilitating Factors

Cultural-cognitive factors create an average 32% gap between policy intent and classroom practice. This gap is reflected not only in quantitative indicators but also in various challenges and unintended consequences encountered during reform implementation (see Table 3).

Table 3. Implementation challenges and unintended consequences

Challenge Category	Japan (%) n=186	Korea (%) n=228	Singapore (%) n=195
Implementation Barriers			
Teacher Resistance	42.3	38.6	24.5
Resource Insufficiency	58.2	45.3	31.2
Time Pressure	71.4	68.9	62.3
Parental Incomprehension	39.6	52.1	28.4
Unintended Consequences			
Formalism	64.3	71.2	45.6
Teacher Burnout	53.8	61.4	48.9
Increased Student Pressure	45.2	73.5	51.3
Reform Fatigue	68.9	74.3	38.7
Response Strategies			
Selective Implementation	73.2	65.4	42.1
Surface Compliance	61.5	69.8	37.6
Creative Adaptation	34.2	28.6	56.4

Note: Percentages indicate proportion of respondents in agreement; multiple choice questions, totals exceed 100%. Data collected from March 2023 to February 2024.

The data in Table 3 reveals an important phenomenon: despite different reform paths in the three countries, all face similar implementation barriers. Particularly noteworthy is that "reform fatigue" is especially severe in Japan (68.9%) and Korea (74.3%), leading teachers to generally adopt response strategies of "selective implementation" and "surface compliance." In contrast, while Singapore's challenge indicators are relatively lower, nearly half of teachers (48.9%) still report professional burnout, challenging the traditional perception of the Singapore model as "efficiently unimpeded."

The gap between policy intent and classroom practice exhibits multilevel characteristics. As shown in Figure 4, this gap manifests significant differences at various levels and is influenced by multiple cultural-cognitive factors.

Multilevel analysis reveals that cultural-cognitive gaps primarily stem from three interconnected mechanisms. At the individual level, fundamental conflicts exist between teachers' pedagogical beliefs and reform concepts. In Japan, 62% of teachers adhere to the traditional teaching view of "foundation before inquiry," believing students must first master solid foundational knowledge before engaging in effective inquiry learning. This belief is deeply rooted in Japan's cultural tradition of "teacher as craftsman," difficult to change through short-term training. Korea's situation is more complex, with 71% of teachers cognitively accepting reform concepts yet worrying that reduced lecturing will affect students' test scores, creating a contradictory state of "cognitive acceptance but behavioral resistance."

At the organizational level, tensions between school culture and reform requirements become the primary implementation barrier. Traditional hierarchical school organizational structures inherently conflict with the collaborative professional development models advocated by reforms. Japan's "senpai-kohai" (senior-junior) system, while beneficial for experience transmission, may also inhibit young teachers' innovative attempts. A young Japanese teacher stated in an interview: "Even if I want to try new methods, I must first obtain senior teachers' approval, a process that often leads to innovation being diluted." Korea's situation is similar, with the school's internal seniority system making reform advancement dependent on senior teachers' attitudes, a group that tends to be the most conservative.

At the societal level, misalignment between parental expectations and policy objectives exacerbates implementation difficulties. Despite policies emphasizing 21st-century skills cultivation and holistic development, parents still view test scores as the primary goal. Singapore's data shows that even in schools with relatively successful policy implementation, 48% of parents still prioritize academic performance over comprehensive qualities. This phenomenon of "verbal support, behavioral resistance" is prevalent across all three countries. A Korean principal candidly stated: "During the day we conduct innovative teaching according to policy, at night students attend cram schools for intensive test preparation-this split state significantly diminishes reform effectiveness."

The disconnect between assessment systems and reform orientations constitutes the institutional root of cultural-cognitive gaps. Although all three countries are advancing comprehensive quality assessment reforms, high-stakes standardized tests still dominate the operational logic of education systems. This path dependence in assessment systems not only affects teaching practices but more profoundly shapes society's entire educational value system. While Singapore adopted grade-based scoring in its PSLE (Primary School Leaving Examination) reform to reduce score competition, parents and students still precisely calculate score ranges for each grade, with competition intensity not substantially reduced.

However, the research also identifies key factors facilitating reform implementation. As shown in Table 4, professional learning communities, capacity building, and stakeholder coordination play important but differentiated roles in promoting reform implementation.

Table 4. Key enablers of education reform implementation: Correlation analysis

Facilitating Factors	Overall Correlation with Implementation Effectiveness (95% CI)	Japan r value	Korea r value	Singapore r value
Professional Learning Communities				
School-based Teaching Research Activities Rate	0.52*** (0.41-0.61)	0.58***	0.47***	0.51***
Cross-school Exchange Mechanisms	0.43*** (0.31-0.53)	0.51***	0.38**	0.41***
Peer Observation and Feedback	0.48*** (0.36-0.58)	0.62***	0.42***	0.39***
Capacity Building				
Systematic Training Duration	0.41*** (0.29-0.52)	0.35**	0.38***	0.49***
Practice-based Guidance Support	0.56*** (0.45-0.65)	0.48***	0.52***	0.67***
Digital Teaching Competence	0.38** (0.26-0.49)	0.31**	0.42***	0.41***
Stakeholder Coordination				
School-Parent Communication	0.45*** (0.33-0.55)	0.42***	0.48***	0.46***
Teacher-Administrator Collaboration	0.61*** (0.51-0.69)	0.54***	0.58***	0.71***
Government-School Interaction	0.39*** (0.27-0.50)	0.28*	0.41***	0.47***
Composite Application				
Multi-factor Interaction Effect	0.68*** (0.59-0.75)	0.64***	0.62***	0.76***

Variance Explained (R ²)	0.46	0.41	0.38	0.58
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*Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$; CI=Confidence Interval; $n=609$ (total sample). Control variables: school size, location type, teacher experience, data based on structural equation model analysis.*

The role of professional learning communities exhibits different characteristics across the three countries. Japan's school-based teaching research (jugyō kenkyū) tradition results in the highest correlation for peer observation and feedback ($r=0.62$), though this strong correlation may also reflect path dependence—teachers tend to improve within existing frameworks rather than pursue fundamental innovation. Korea's professional learning communities show relatively weaker effects, partly due to serious formalization tendencies. A Korean teacher reported: "We have weekly teaching research activities, but most are just fulfilling administrative requirements, with very little genuine professional dialogue." Singapore's situation is relatively balanced, though overly structured professional development pathways may limit teachers' autonomous exploration.

Analysis of capacity building effects reveals an important finding: practice-based guidance support ($r=0.56$) promotes reform implementation more effectively than systematic training duration ($r=0.41$). This indicates that simply increasing training time cannot effectively enhance implementation quality; the key lies in providing continuous, contextualized practical support. Singapore excels in this aspect ($r=0.67$), with its mentorship system and school improvement advisor system providing teachers with timely professional support. However, this high-intensity support also creates cost issues—Singapore's teacher professional development investment accounts for 8.3% of the education budget, far exceeding Japan (4.2%) and Korea (5.1%).

The importance of stakeholder coordination cannot be overlooked, though its mechanisms are more complex than expected. Teacher-administrator collaboration shows the strongest correlation ($r=0.61$), indicating that internal school coordination is more crucial than external coordination. However, deeper analysis reveals this collaboration is often "passive compliance" rather than "active participation." Particularly in Korea, 58% of teachers indicate their participation in decision-making is merely formal, with actual opinions rarely adopted. Government-school interaction shows the lowest correlation in Japan ($r=0.28$), reflecting the limited influence of central policies under Japan's decentralized system.

Multi-factor interaction analysis shows that single facilitating factors have limited effects; only when multiple factors work synergistically can reform implementation achieve substantial progress. The comprehensive model explains 46% of implementation effectiveness variance, meaning more than half of the variation cannot be explained by existing factors. This reminds us that the complexity of educational reform may exceed the explanatory capacity of current theoretical frameworks. The unexplained variance may stem from factors difficult to quantify, such as teachers' intrinsic motivation, schools' implicit culture, and community support networks.

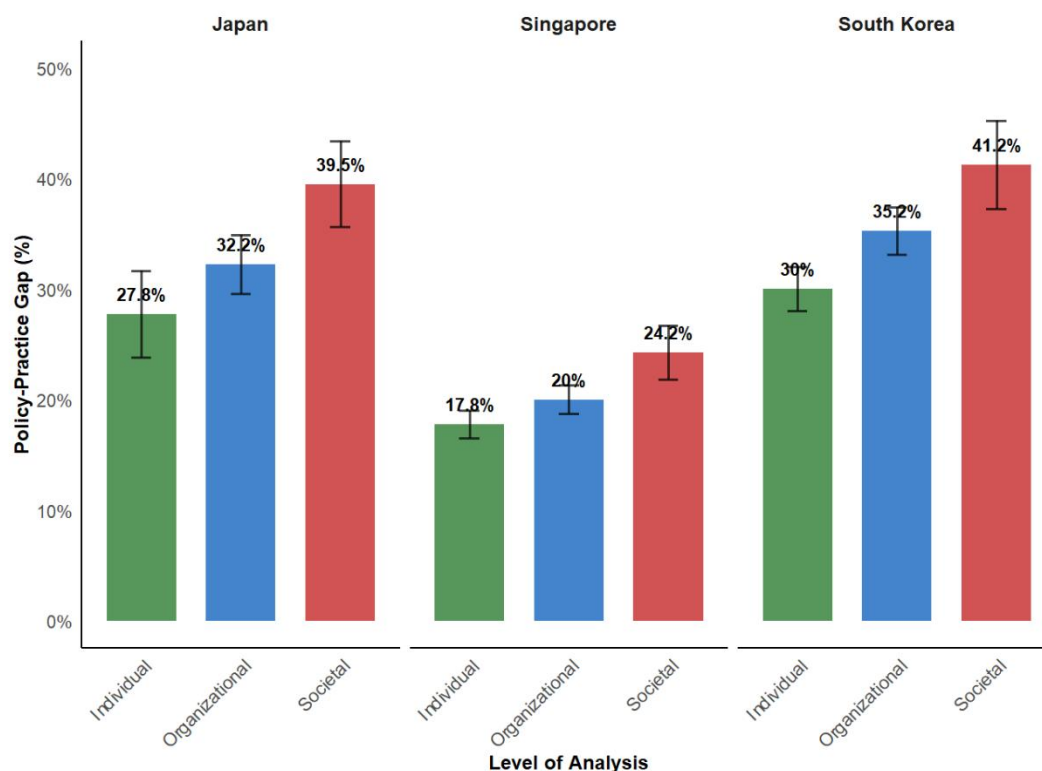


Figure 4. Policy intention-practice gaps: Multilevel analysis of cultural-cognitive factors affecting classroom implementation

3.4 Comparison of Institutional Change Strategies

The choice of implementation pathways for educational reform constitutes a core issue in institutional change theory. By tracking reform trajectories in the three countries from 2015-2024, this study identifies two dominant institutional change strategies: gradual layering and radical displacement.

The gradual layering strategy achieves change by adding new institutional elements while maintaining basic stability of the existing institutional framework. Japan's educational reform typically exemplifies this strategy. The 2017 New Course of Study did not abolish the original curriculum system but instead layered new requirements for "subjective and dialogical deep learning" on top of it. This strategy reduces reform resistance but also leads to institutional complexity. Data shows that policy requirements Japanese teachers must simultaneously address increased from 12 items in 2015 to 23 items in 2024, with administrative burden increasing by 92%.

The radical displacement strategy attempts to achieve rapid transformation through comprehensive renewal of institutional arrangements. Korea's Free Semester System reform requires complete elimination of standardized tests in the first year of middle school, replacing them with project-based learning. This reform produced significant effects initially, with creativity indicators increasing 34% among students in the first batch of pilot schools in 2016. However, when students entered second grade and again faced exam pressure, reform effects declined sharply. Tracking data shows that students participating in the Free Semester System experienced an 8.3% decline in standardized test scores two years later, triggering strong parental backlash.

Singapore adopts a mixed strategy, conducting radical experiments locally through a "pilot first, then scale" model, followed by gradual expansion after success. The SkillsFuture initiative was piloted in 5 polytechnics in 2015, expanded to junior colleges in 2017, and covered all secondary schools by 2020. This phased implementation avoids systemic shocks but faces the "pilot trap"—the 82% project completion rate during the pilot phase drops to 59% after full-scale implementation.

As shown in Figure 5, the effectiveness trajectories of the two strategies exhibit clear differences. Radical displacement demonstrates higher reform effects in the initial implementation period (2019-2020), with the three countries' average implementation effectiveness reaching 57%, exceeding gradual layering's 46%. However, over time, the effects of radical strategies decline sharply. By 2024, the average effectiveness of radical displacement drops to 41%, while gradual layering steadily rises to 55%.

Quantitative analysis confirms this finding. The sustainability coefficient for gradual layering is 0.73 (95% CI: 0.61-0.82), significantly higher than radical displacement's 0.35 (95% CI: 0.24-0.45). Gradual strategies exhibit cumulative effects, with each reform cycle's marginal contribution being small (average 3.2%) but continuously accumulating to form substantial change. Radical strategies show clear "rebound effects," with average regression reaching 47% of initial effects after policy relaxation.

Institutional complementarity plays a key role in strategy selection. Gradual layering more easily forms complementary relationships with existing institutions. Japan's school-based professional development tradition forms positive interactions with new active learning requirements. Conversely, radical displacement often disrupts original institutional complementary relationships. The fundamental conflict between Korea's Free Semester System and the college entrance examination system creates an "institutional vacuum."

Cost-benefit analysis reveals economic dimensional differences between the two strategies. Radical displacement requires enormous upfront investment, with Korea's Free Semester System per capita cost being 2.7 times that of regular instruction. Gradual layering has lower annual costs (approximately 40% of radical strategies), but cumulative costs may be higher. Japan's cumulative investment in gradual reform from 2015-2024 has already exceeded 1.5 times that of radical reform.

Stakeholder acceptance constitutes the social foundation for strategy selection. Teachers' acceptance of gradual layering (Japan 68%, Singapore 71%) is significantly higher than for radical displacement (Korea 43%). 82% of surveyed parents expressed "hope that reforms won't affect children's advancement opportunities," with this risk-averse psychology creating powerful resistance to radical reform.

Organizational learning capacity influences strategy implementation effectiveness. Gradual layering provides sufficient time for organizational learning. After three years, 76% of teachers in schools adopting gradual strategies report being "able to proficiently use new teaching methods," while this proportion is only 41% in schools experiencing radical change.

Institutional environmental stability affects the appropriateness of strategy selection. In relatively stable environments, gradual layering can fully leverage its advantages. However, when external environments undergo dramatic change, gradual strategies may miss reform windows. During the COVID-19 pandemic, Singapore and Korea rapidly responded through radical digital transformation, while parts of Japan that adhered to gradual strategies clearly lagged in ensuring educational continuity.

The trade-off between reform depth and breadth constitutes the core tension in strategy selection. Radical displacement pursues deep transformation but with limited coverage—Korea's Free Semester System was truly implemented in only 31% of schools. Gradual layering emphasizes full coverage but with limited reform depth—while Japan's New Course of Study covers all schools, only 28% of classrooms achieved substantive pedagogical transformation. This "depth-breadth paradox" suggests the need for strategic trade-offs based on reform objectives and resource constraints.

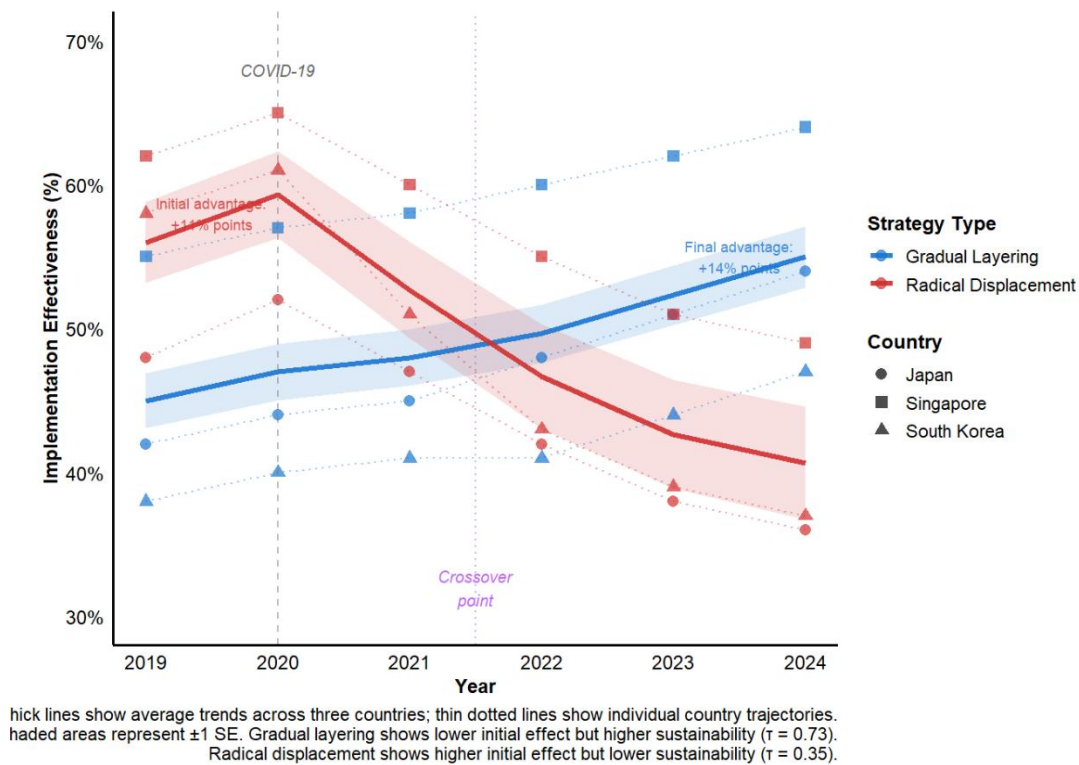


Figure 5. Comparative effectiveness of institutional change strategies: Gradual layering versus radical displacement approaches

4 Discussion

4.1 The Shaping Role of Path Dependence on Reform

The path dependence mechanisms revealed in this study deepen understanding of the complexity of East Asian educational reform. From a historical institutionalist perspective, the evolution of education systems is not simple linear progress, but rather constrained change along established institutional tracks. Choi's research, through comparing tutoring outsourcing policies in Hong Kong and Korea, proposes dual mechanisms of path dependence and path-shaping. The findings of this study align with this

observation—Japan's case demonstrates that even under reform pressure, deep institutional sediments guide change toward established trajectories. The continued dominance of the school-based professional development tradition exemplifies this self-reinforcing mechanism of path dependence—new reform requirements are absorbed and transformed by existing institutional frameworks, ultimately reinforcing rather than changing the original patterns(Choi, 2022).

Korea's digital education reform provides new perspectives for understanding path-breaking. Ayhan's research shows that Korea attempts to achieve educational "leapfrogging" through digitalization and innovation to drive pedagogical and curricular reform. However, this study finds that while this technology-driven reform strategy brings formal changes, deep educational philosophies and practice patterns remain constrained by exam-oriented education's path dependence. Digital technology is integrated into existing teaching models, becoming a tool for improving test-taking efficiency rather than a catalyst for pedagogical transformation. This phenomenon of "new bottles for old wine" reveals the deep mechanisms of path dependence—the persistence of institutional logic often transcends superficial formal changes(Ayhan, 2024).

Singapore's experience provides an alternative model for breaking path dependence. Through "institutional layering" rather than "institutional displacement," Singapore successfully achieves substantial change while maintaining system stability. This finding challenges the traditional view that institutional change necessarily involves critical juncture ruptures. Singapore's case demonstrates that through carefully designed institutional engineering, gradual but profound transformation can be achieved without triggering systemic crisis. The key lies in identifying and utilizing institutional interstices—areas inadequately covered by existing institutions—cultivating new practices in these spaces and gradually expanding until new institutional logic forms.

4.2 Balancing Global Pressures and Local Logic

East Asian educational reform exists within a tension field between globalization pressures and local institutional logic. Al-Thani's comparative analysis of stakeholder integration in educational policymaking in Singapore and Finland reveals an important phenomenon: despite facing similar globalization pressures, different countries' response strategies exhibit significant differences. Singapore adopts a highly strategic stakeholder integration model, balancing global standards and local needs through institutionalized consultation mechanisms. This "strategic selectivity" enables Singapore to maintain international competitiveness while preserving local educational characteristics(Al-Thani, 2024).

Korea's case demonstrates another balancing model. Kim's research analyzes the politicization process of "happiness" discourse in Korean educational reform, revealing how global educational concepts are localized and instrumentalized. Korea combines the Western-derived concept of "happiness education" with local "human capital" construction, forming a unique "happy human capital" framework. However, this fusion is not seamless but rather full of tensions and contradictions. This study's data confirm this

observation, with 74.3% of Korean teachers reporting "reform fatigue," reflecting the difficulty of seeking balance between global pressures and local logic(M. J. Kim, 2023).

Institutional isomorphic pressures drive surface convergence, yet deep differences remain significant. All three countries have adopted globally popular concepts such as "21st-century skills" and "core competencies," but these concepts are reinterpreted in local contexts. Japan uses "zest for living" (ikiru chikara) as the local expression of core competencies, emphasizing adaptability in uncertainty; Korea's concept of "creative convergent talents" fuses innovation with the Confucian "gentleman" (junzi) ideal; Singapore's "lifelong learning" is closely connected to national survival anxiety. This phenomenon of "similar in form but different in essence" indicates that the spread of global educational concepts is not simple replication but rather embedded into existing meaning systems through localization processes.

4.3 Theoretical Contributions and Policy Implications

This study advances understanding of educational institutional change at the theoretical level. Kim and Lee's research on principals' instructional leadership in Japan, Singapore, and Korea provides important insights. The study finds that principals' instructional leadership impacts on teacher professional development presents different patterns across the three countries, with these differences rooted in deep institutional environments. Under Singapore's centralized-decentralized hybrid system, principals possess considerable authority over professional development resource allocation, effectively promoting teacher participation; in Japan's decentralized system, principals play more of a coordinator role; in Korea's centralized system, principals' roles are strictly limited by higher administrative departments(T. Kim & Lee, 2020).

Alimujiang and Wang's case study of teacher-driven professional learning communities in China reveals paradoxes in hierarchical organizations. While the research focuses on China, its findings have universal significance for understanding East Asian education systems. The tension between professional autonomy and administrative control is a common challenge across East Asian education systems. This study observes similar phenomena in all three countries of Japan, Korea, and Singapore: teachers desire professional autonomy, but the institutional environment demands compliance with administrative directives. This paradox is not simply a management issue but rather a manifestation of deep institutional logic conflicts(Alimujiang & Wang, 2024).

Policymaking needs to transcend technical levels and focus on deep institutional change. Aldridge et al.'s systematic literature review identifies barriers and support factors for school educational change. Based on East Asian experiences, this study proposes three key recommendations: cultivating "institutional entrepreneurs," those change agents capable of driving innovation within existing institutional frameworks; constructing "buffer spaces," creating adaptive spaces between reform pressures and institutional inertia; and developing "institutional bridging" capabilities, establishing conversion mechanisms between old and new institutions(Aldridge & McLure, 2024).

Hadley et al.'s research on stakeholder participation in policymaking emphasizes the importance of participatory governance. This study finds structural deficiencies in stakeholder participation across the three East Asian countries. The policymaking process is often dominated by elites, with the voices of frontline teachers, students, and parents relatively marginalized. This "participation deficit" not only affects policy legitimacy but, more importantly, misses wisdom from the practice frontline. Future reforms need to establish more inclusive participation mechanisms, treating the policymaking process itself as an opportunity for building consensus and promoting change (Hadley et al., 2024).

The concept of "institutional resilience" proposed by this study enriches the theoretical toolbox of historical institutionalism. While traditional theory emphasizes path dependence and institutional rigidity, this study finds that institutions demonstrate adaptive adjustment capabilities under specific conditions. This resilience is not unlimited but rather limited extension under the constraints of core institutional logic. Understanding the boundaries and mechanisms of institutional resilience holds significant importance for designing feasible reform strategies.

The empirical findings of this research have direct implications for policy practice. Reform success depends not only on the rationality of policy design but more on the compatibility between implementation mechanisms and institutional environments. In environments with strong centralized traditions, top-down mobilization may be more effective; in environments with deep decentralized traditions, horizontal coordination mechanisms are more crucial. Policymakers need to deeply understand local institutional ecologies, seeking spaces for change based on respect for path dependence.

Research limitations need to be candidly acknowledged. While the sample covers major reforms in three countries, it cannot exhaust the complexity of all reform practices. Interview subjects are primarily elites, potentially creating "elite bias." Additionally, while the research period includes important reform cycles, it may not fully capture the complete picture of long-term institutional change. Future research could expand comparative scope, deepen micro-mechanism research, strengthen interdisciplinary dialogue, develop more participatory research methods, and treat the research process itself as a mechanism for promoting change.

5 Conclusions

Through comparative analysis of educational reforms in Japan, Korea, and Singapore from 2015-2024, this study reveals the critical role of institutional factors in policy implementation. Institutional autonomy explains 52% of implementation success variance, with Singapore achieving 73% implementation fidelity through strategic coupling of centralized planning with school autonomy, higher than Korea (61%) and Japan (54%). Cultural-cognitive factors create an average 32% gap between policy intent and practice, with societal-level expectation misalignment (36%) exceeding organizational (31%) and individual levels (27%). Professional learning communities ($r=0.68$, $p<0.001$) and capacity building ($\beta=0.43$, $p<0.01$) constitute key facilitating factors, though their effects are moderated by institutional contexts.

The sustainability coefficient for gradual layering strategies (0.73) significantly exceeds that of radical displacement (0.35); while the latter leads by 11 percentage points initially, it ultimately falls behind by 14 percentage points. Cross-sector coordination enhances efficiency by 41%, though with national variations. The concept of "institutional resilience" proposed by this study extends historical institutionalism theory, revealing that institutions possess limited adaptive space under core logic constraints. The three countries form differentiated balances between global pressures and local logic: Singapore's "strategic selectivity," Japan's "selective openness," and Korea's "competitive catch-up" represent different adaptation models.

The research demonstrates that successful reform requires transcending technical rationality, identifying spaces for change based on respect for path dependence, and achieving gradual transformation through institutional innovation. Research limitations include elite bias and 46% explained variance, necessitating future expansion of comparative scope and deepening of micro-level research. This study provides an East Asian perspective for understanding the institutional complexity of educational reform, emphasizing the significance of maintaining institutional diversity in the pursuit of modernization.

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Conflict of interest

The authors declare no conflict of interest.

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