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## Capacity-Learning Paradox

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Sharma, Shubham; Wu, Xun; Papyshv, Gleb

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## ORIGINAL ARTICLE OPEN ACCESS

# Capacity-Learning Paradox: How Hong Kong and Singapore's Crisis Responses Shape and Are Shaped by Policy Capacities

Shubham Sharma<sup>1</sup>  | Xun Wu<sup>2</sup> | Gleb Papyshev<sup>3</sup>

<sup>1</sup>Faculty of Architecture and the Built Environment, TU Delft, Delft, the Netherlands | <sup>2</sup>Innovation, Policy and Entrepreneurship Thrust, Hong Kong University of Science and Technology (Guangzhou), Guangzhou, China | <sup>3</sup>Division of Social Science, The Hong Kong University of Science and Technology, Hong Kong, China

**Correspondence:** Shubham Sharma ([ssharmaad@connect.ust.hk](mailto:ssharmaad@connect.ust.hk))

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**Palabras Clave:** aprendizaje de políticas | capacidad política | gestión de crisis | desarrollo de capacidades | rendición de cuentas

## ABSTRACT

This study examines the paradoxical relationship between policy learning and capacity: governments need certain capacities to learn effectively, yet these same capacities often emerge from previous learning experiences. Through a comparative analysis of Hong Kong and Singapore's responses to SARS and COVID-19, we demonstrate how policy learning requires and manifests as enhanced analytical, operational, and political capacities. Our research reveals three key findings. First, learning outcomes materialize as enhanced capacities rather than just cognitive shifts and accumulated knowledge, as evidenced by both cities' institutional developments following SARS. Second, the effectiveness of learning processes depends heavily on existing capacities, particularly political capacity, which enables or constrains the deployment of analytical capacities. Third, capacity development is not linear—while both cities addressed many capacity gaps identified during SARS, COVID-19 exposed new vulnerabilities in areas like cross-border coordination and inclusive crisis management. These findings advance theoretical understanding of policy learning by showing how it manifests through changes in capacities. They also highlight the interdependence of different capacity types, particularly how political capacity enables or constrains the effectiveness of analytical and operational capabilities. For practitioners, our analysis emphasizes the importance of balanced capacity development and maintaining strong political trust alongside technical capabilities for effective crisis management.

## 摘要

本研究分析了政策学习与能力之间的矛盾关系:政府需要具备某些能力才能有效学习,而这些能力往往源于以往的学习经验。通过对香港和新加坡在非典(SARS)和新冠肺炎(COVID-19)方面的响应措施进行比较分析,我们揭示了政策学习如何需要并体现为增强的分析能力、操作能力和政治能力。我们的研究得出三个关键发现。第一,学习成果体现为能力的提升,而不仅仅是认知转变和知识积累,正如这两个城市在非典之后的制度发展所证明的那样。第二,学习过程的有效性在很大程度上取决于现有能力,尤其是政治能力,这既能促进也能限制分析能力的部署。第三,能力发展并非是非线性的——虽然这两个城市都弥补了非典期间发现的许多能力差距,但新冠肺炎疫情暴露了跨境协调和包容性危机管理等领域的弱点。这些发现通过展示政策学习如何通过能力的变化体现出来,从而推进了对政策学习的

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理论理解。研究发现还强调了不同能力类型之间的相互依存关系；尤其是政治能力如何促进或限制分析能力和行动能力的有效性。对于实践者而言，我们的分析强调了“平衡的能力发展、以及在技术能力之外维持牢固的政治信任”一事对于有效危机管理的重要性。

## RESUMEN

Este estudio examina la relación paradójica entre el aprendizaje de políticas y la capacidad: los gobiernos necesitan ciertas capacidades para aprender eficazmente, pero estas mismas capacidades a menudo surgen de experiencias de aprendizaje previas. Mediante un análisis comparativo de las respuestas de Hong Kong y Singapur al SARS y la COVID-19, demostramos cómo el aprendizaje de políticas requiere y se manifiesta en capacidades analíticas, operativas y políticas mejoradas. Nuestra investigación revela tres hallazgos clave. En primer lugar, los resultados del aprendizaje se materializan en capacidades mejoradas, en lugar de simples cambios cognitivos y conocimiento acumulado, como lo demuestra el desarrollo institucional de ambas ciudades tras el SARS. En segundo lugar, la eficacia de los procesos de aprendizaje depende en gran medida de las capacidades existentes, en particular la capacidad política, que facilita o limita el despliegue de capacidades analíticas. En tercer lugar, el desarrollo de capacidades no es lineal: si bien ambas ciudades abordaron muchas deficiencias de capacidad identificadas durante el SARS, la COVID-19 expuso nuevas vulnerabilidades en áreas como la coordinación transfronteriza y la gestión inclusiva de crisis. Estos hallazgos amplían la comprensión teórica del aprendizaje de políticas al mostrar cómo se manifiesta a través de cambios en las capacidades. También destacan la interdependencia de los diferentes tipos de capacidad; en particular, cómo la capacidad política facilita o limita la eficacia de las capacidades analíticas y operativas. Para los profesionales, nuestro análisis enfatiza la importancia de un desarrollo equilibrado de capacidades y de mantener una fuerte confianza política junto con las capacidades técnicas para una gestión eficaz de las crisis.

## 1 | Introduction

Policy learning presents a fundamental paradox: governments require specific capacities to learn effectively; however, these capacities are frequently the result of past learning experiences. This paradox becomes particularly visible during crises, where governments must simultaneously draw on existing capabilities while developing new ones. The COVID-19 pandemic, claiming nearly 7 million lives, dramatically illustrated this challenge as governments struggled to learn and adapt while managing an unprecedented health crisis (Sheikh and Abimbola 2021). While some jurisdictions effectively leveraged past experiences to enhance their response capabilities, others struggled to translate previous lessons into effective action.

Despite renewed scholarly interest in policy learning, particularly following COVID-19, fundamental conceptual challenges persist. As Bennett and Howlett (1992) noted three decades ago, the field continues to suffer from conceptual ambiguity, particularly in understanding how learning occurs and manifests in practice (Zaki and Wayenberg 2023). While much of the existing literature treats learning outcomes primarily as cognitive shifts (Hall 1993) and knowledge accumulation (May 1992), we present an alternative analytical view of policy learning as the changes in skills and capacities that enable future learning and adaptation. This alternative view helps resolve the learning paradox by showing how learning processes both require and generate different forms of policy capacity.

This study addresses the question: How do different dimensions of policy capacity both emerge from and facilitate the policy learning process? To answer this, we employ the policy capacity framework (Wu et al. 2015) to examine how analytical, operational, and political capacities shape and are shaped by learning processes. This framework, which categorizes capacities across individual, organizational, and systemic levels, provides a structured approach to illustrate the interrelationship between policy learning and policy capacity.

The cases of Hong Kong and Singapore's responses to SARS and COVID-19 provide an ideal setting to examine this learning-capacity relationship. Both cities underwent intensive learning during SARS, developing distinct institutional capabilities that influenced their subsequent COVID-19 responses. As Lee et al. (2020) demonstrate, East Asian governments' responses to previous epidemics created distinctive institutional memories and capabilities that shaped their COVID-19 strategies. However, these jurisdictions diverged significantly in how effectively they translated past learning into enhanced capacities (Hartley and Jarvis 2020; Woo 2020).

Our analysis makes several contributions to understanding policy learning processes. First, by outlining the role of capacity in learning and defining learning outcomes in terms of policy capacity, we provide a more concrete and measurable way to assess policy learning. Furthermore, our framework illuminates how different dimensions of capacity enable or constrain future learning opportunities, addressing recent calls to better understand the multi-level dynamics of policy learning (Sheikh and Abimbola 2021; Zaki and Wayenberg 2023) and its interaction with policy capacity (Dunlop 2015). Finally, by examining how learning processes interact with various forms of capacity, we offer practical insights for governments seeking to enhance their crisis management capabilities.

The paper proceeds as follows. We first review the literature on policy learning and capacity, developing our argument to demonstrate the interrelationship between policy learning and policy capacity. We then outline our comparative case study methodology and present our analysis of Hong Kong and Singapore's experiences. Our findings reveal how different dimensions of policy capacity shaped learning processes during both crises, while also showing how learning outcomes became embedded as new organizational capabilities. We conclude by discussing implications for theory and practice, particularly how governments can better develop the capacities needed for effective crisis learning and adaptation.

## 2 | Literature Review

The objective of this section is twofold. First, we examine the theoretical foundations of policy learning, highlighting the need to understand learning outcomes not just changes or updates in beliefs and values, and knowledge acquisition, but also as capacity development. Second, we explore how policy capacity literature offers insights into the mechanisms and capacities that both enable and result from learning processes. Through this review, we build the theoretical basis for understanding the reciprocal relationship between policy learning and capacity development.

### 2.1 | Theoretical Foundations of Policy Learning

Policy learning has been a central concept in public policy research, traditionally focusing on how governments acquire and use knowledge to improve policies. However, a precise definition of policy learning is crucial for advancing theoretical and empirical research. On the basis of the nature of change emanating from learning, we differentiate between learning as belief and value change (Dunlop and Radaelli 2018b; Nowlin 2024), knowledge acquisition (May 1992) and learning as a capacity-building process that enhances governance capabilities.

The belief and value-oriented approach to policy learning is well-established in public policy scholarship. Heclo (1974) first introduced social learning, where policymakers adjust their perceptions and preferences based on experience and interaction. Hall (1993) extended Heclo's work by conceptualizing policy paradigms, drawing analogies with Kuhn's (1962) theory of scientific revolutions, where fundamental shifts in ideas lead to systemic policy change. The notion that policy learning results in paradigm shifts remains influential, as seen in works such as Dunlop and Radaelli (2013) and Kamkhaji (2017).

Both Heclo and Hall engage with ideas of learning in governance by focusing on the transformation of beliefs and values rather than the institutional mechanisms that facilitate sustained learning. Their frameworks draw inspiration from Karl Deutsch's cybernetic approach to governance, which conceptualizes governments as adaptive systems that process information and adjust policies through feedback loops (Deutsch 1966).

While Hall and Heclo implicitly align with Deutsch's emphasis on learning as a feedback-driven process, their work largely diverges from Deutsch's capacity-oriented perspective, which views learning as an institutional function necessary for effective governance. In contrast to Heclo's interpretative learning and Hall's paradigm shift model, Deutsch (1966) conceptualized learning as the ability of political systems to process and act upon information effectively, highlighting capacity-building as a core function of governance. Thus, rather than fully building on Deutsch's work, Hall and Heclo developed more ideational frameworks of learning that placed greater emphasis on the transformation of policy ideas than on institutional adaptation and policy capacity.

Recent scholarship has increasingly moved beyond ideational shifts and has begun recognizing policy learning as an enabler

of institutional capacity-building. May (1992) distinguished between instrumental learning, which focuses on policy tools and their effectiveness, and social learning, which involves problem construction and policy framing. Sanderson (2002) further argued that governments accumulate knowledge through evaluation mechanisms that inform future policy action. However, this knowledge-centric view provides an incomplete picture of how learning translates into the development of governance competencies over time.

A more pragmatic approach conceptualizes learning not just as knowledge acquisition but as a process that enhances analytical, operational, and political capacity. Dunlop and Radaelli (2018a, 2018b) propose that learning extends beyond cognitive shifts, as it becomes institutionalized within bureaucratic routines and governance practices. Similarly, Capano et al. (2020) argue that past learning manifests as enhanced policy capacity, suggesting that learning outcomes should be understood in terms of improved institutional competencies rather than just accumulated knowledge. This perspective aligns with organizational learning theories (Schatzki 2005), which demonstrate how learning becomes embedded in institutional structures, shaping future policy adaptation.

Additionally, Sabel and Zeitlin (2008) highlight experimentalist governance, where continuous policy adjustments contribute to institutional resilience, reinforcing the idea that learning is an iterative, capacity-building process rather than just a one-time paradigm shift. Haas (1992) on epistemic communities and Etheredge (1981) on bureaucratic learning further illustrate that policy learning occurs across multiple levels, from elite policymakers to frontline bureaucrats, necessitating a broader conceptualization of learning beyond macro-level paradigm shifts.

Building on these insights, we propose an understanding of policy learning as an iterative process in which governments utilize existing policy capacities to interpret and learn from experiences, thereby simultaneously reinforcing and expanding those capacities to address future policy challenges. This extends beyond traditional models that frame learning as either belief shifts or knowledge acquisition. Instead, we propose an alternative understanding that learning should be seen as a process that strengthens governance capacities, enabling policymakers to not only refine policies but also improve institutional adaptability and problem-solving abilities over time. By framing policy learning in terms of policy capacity, we contribute to an evolving understanding of how governments learn not only through belief change but also through the institutionalization of effective governance practices.

### 2.2 | Policy Learning and Policy Capacity

The relationship between policy learning and policy capacity (parts of it in different forms) has been discussed in the literature. For example, Dunlop (2015) demonstrated the relationship between organizational political capacity and reflexive learning and further extended the idea to link epistemic, bargaining, and hierarchy learning arenas with the analytical, absorptive and administrative capacities at the organizational level (Dunlop and Radaelli 2018a). Here, the administrative capacity refers



to the skilful management of resources, which can be broadly defined as the operational capacity. Similarly, Howlett (2009) focused on the role of analytical capacity in enhancing policy learning as the ability to process and utilize implementation feedback.

Beyond the role of capacity in the learning process, the learning outcomes also yield changes in policy capacities. The outcome of policy learning is essentially seen as policy changes which can largely be understood as changes in legislation (Baumgartner and Jones 2010; Trein 2018) and institutional changes (Streeck and Thelen 2005). Such an operationalization of policy changes can be understood as learning outcomes (for a detailed discussion on the outcomes of policy learning, please see Dunlop et al. (2018)). In this article, we treat learning outcomes as policy capacity (Table 1), since institutions, legislation, politics, and their interrelationships at multiple levels constitute different policy capacities (Wu et al. 2015).

In this context, the use of the policy capacity framework offers a structured approach to outline the reciprocal relationship between policy learning and policy capacity. Wu et al. (2015) define policy capacity as the set of skills, competencies, and capabilities that enable effective policy development and implementation. Their capacity framework provides a comprehensive approach to understanding the various dimensions (analytical, operational, and political) and levels (individual, organizational and system) at which capacity operates.

Analytical capacity encompasses the skills and resources needed for evidence-based policymaking. At the individual level, this includes capabilities in data analysis, research methodologies, and evidence gathering. Organizations require institutional mechanisms for collecting and processing policy-relevant information, while system-wide analytical capacity involves broader knowledge creation and sharing networks, and evaluation mechanisms. During crises, strong analytical capacity enables organizations to rapidly assess situations, process new information, and generate evidence-based responses (Howlett 2009).

Operational capacity focuses on the practical aspects of policy implementation and management. Individual operational capacity involves competency in managing resources and understanding implementation tools. At the organizational level, this includes administrative structures, accountability mechanisms, and resource management systems. System-level operational capacity encompasses inter-agency coordination mechanisms and efficient administrative networks. As Goh (2002) demonstrates, operational capacity is crucial for translating policy decisions into effective action, particularly during crises where rapid response is essential.

Political capacity reflects the ability to manage political relationships and build support for policy initiatives. Individual political capacity includes skills in stakeholder engagement, negotiation, and political communication. Organizations need capabilities for coalition building and maintaining legitimacy, while system-level political capacity involves broader governance structures that enable consensus-building and ensure political accountability. Boin et al. (2008) highlight how political capacity shapes

crisis response by influencing public trust and stakeholder cooperation. These dimensions of capacity are intrinsically linked to learning processes.

To summarize, a strong analytical capacity enables systematic evaluation and learning from policy experiences. As Howlett et al. (2014) note, organizations with robust analytical capacity are better positioned to identify lessons from past experiences and integrate them into future policy decisions. Operational capacity facilitates the implementation of learning outcomes and the transfer of knowledge across organizational units. Political capacity shapes both the incentives for learning and the ability to translate lessons into institutional reforms.

The inclusion of political capacity in the policy capacity framework further allows for accounting for undue influence on policy learning (Leong and Howlett 2022) which could result in negative changes in the policy capacity as learning outcomes, and related mitigatory measures, such as learning governance (Zaki 2024). Political capacity discussed at all three levels in the framework stresses the capacities related to negotiation, political judgment, stakeholder engagement, societal trust, legitimacy, and accountability structures. These skills and capacities, when present, at each level allow for context-specific interpretation and direction of learning. However, to an extent, these skills and capacities determining the interpretation of new information are often a result of deeply rooted institutional ideas and historically established courses (Hall and Taylor 1996; Zysman 1994) and require changes and updates in beliefs (an ideational form of policy learning). This raises the possibility that paradigm shifts can be driven by policy capacity—particularly the capacity to involve non-state actors, as Hall (1993) demonstrated in the shift from Keynesian to Monetarist approaches. However, we do not pursue this topic further, given that our empirical context does not exhibit an immediate paradigm shift.

Building on the foregoing discussion, Table 1 synthesizes key insights from the literature, outlining the paradoxical relationship between policy capacity and policy learning across various levels.

### 2.3 | Policy Learning and Capacity in Crisis Contexts

Crisis serve as powerful catalysts for both learning and capacity development. The heightened scrutiny and urgency during crises can accelerate learning processes but also reveal capacity constraints that limit effective responses (Kamkhaji and Radaelli 2017). Studies of crisis-driven learning highlight how past experiences shape the capacity for managing subsequent challenges. For instance, Lee et al. (2020) demonstrate how East Asian governments' responses to previous epidemics created distinctive capacities that influenced their COVID-19 strategies. The nature of the crisis—whether fast-burning or slow-burning, familiar or novel ('t Hart and Boin 2001)—affects both learning opportunities and capacity requirements. Multiple crisis experiences can lead to the development of more sophisticated response capabilities, as organizations institutionalize lessons through enhanced procedures, structures, and skills (Pahl-Wostl et al. 2013). However, the effectiveness of this learning

**TABLE 1** | Relationship between policy capacity and policy learning.

Dimension	Level	How capacity enables learning	How learning enhances capacity	Examples and references
Analytical capacity	Individual	Individuals with robust analytical skills (e.g., problem-solving, and critical thinking) can systematically collect, interpret, and evaluate evidence. Accountability structures (such as performance evaluations) trigger feedback loops that depend on these skills	Reflecting on evaluative feedback and case studies improves individuals' analytical techniques, leading to improved diagnostic and forecasting skills through formal training or on-the-job learning	Radaelli's work on evaluative learning in policy actors; see Dunlop and Radaelli (2013) for frameworks linking analytical skills to learning outcomes
	Organizational	Established data systems, standardized evaluation routines, and dedicated research units provide organizations with structured information flows that inform learning processes	Lessons from policy outcomes prompt revisions of analytical procedures, integration of new data sources, and the institutionalization of best practices, thereby evolving the organization's information processing capacity	Armitage et al. (2008) discuss how organizational learning routines enhance evidence-based policy making; Wu et al. (2015) emphasize the role of information infrastructure
Operational capacity	Systemic	At the systemic level, networks of think tanks, academic institutions, and inter-agency advisory boards facilitate the circulation and synthesis of policy-relevant knowledge across sectors and jurisdictions	System-wide learning—via policy transfer and cross-national comparisons—leads to reforms in analytical frameworks and the establishment of new knowledge-sharing platforms that upgrade overall analytical infrastructure	Dolowitz and Marsh (1996) on policy transfer, experts, information and learning; Stone et al. (2020) on capacities of recipient countries impeding learning through transfer; Wu et al. (2015) on building systemic analytical capacity
	Individual	Individuals skilled in implementation (project management, process coordination) can detect operational challenges during policy execution and provide timely feedback	Experiential learning from operational setbacks and successes leads to improved practical skills, as well as adaptive approaches that refine individual performance in complex settings	Howlett and Ramesh (2016) illustrate how frontline experiences translate into improved operational competencies; reflective practice as a learning tool is also noted in public management literature
	Organizational	Formalized procedures, coordination mechanisms, and performance monitoring systems allow organizations to systematically capture lessons from implementation processes	Learning from these experiences enables organizations to update their protocols, improve resource allocation, and streamline coordination, thus reinforcing their operational effectiveness	See (Dunlop 2015; Dunlop and Radaelli 2018a)
	Systemic	Cross-agency coordination frameworks and shared administrative infrastructures enable the collection and dissemination of performance metrics across the governance system, setting the stage for collective learning	System-wide learning processes foster the development of common standards and protocols, as well as collaborative problem-solving networks, which then reinforce systemic operational capacities	See Marengo (1992) on the role of coordination in organizational learning and Provan and Kenis (2008) on network governance and collaborative learning in enhancing inter-agency coordination

(Continues)

TABLE 1 | (Continued)

Dimension	Level	How capacity enables learning	How learning enhances capacity	Examples and references
Political capacity	Individual	Individual political acumen—including negotiation, communication, and accountability—is essential for engaging in evaluative processes (e.g., stakeholder consultations) that produce critical feedback	Learning from these political interactions refines individual capabilities in political judgment, crisis management, and adaptive negotiation, contributing to enhanced accountability practices	Dunlop and Radaelli (2013, 2018b) examine how feedback loops in accountability mechanisms enhance political learning at the individual level
	Organizational	Organizations with established legitimacy and robust accountability frameworks can institutionalize formal evaluation mechanisms (e.g., performance audits, and stakeholder feedback) that drive policy learning	Insights gained from these evaluations lead to improved strategies for stakeholder engagement and legitimacy-building, thus reinforcing the organization's political capacity	Armitage et al. (2008) and Moyson and Scholten (2018) discuss the role of institutional legitimacy and feedback loops in bolstering political capacity through learning
	Systemic	System-level oversight structures, transparency mandates, and participatory governance enable comprehensive evaluations and accountability processes that trigger learning across the system	Systemic learning leads to reforms in governance practices, enhanced transparency, and more robust accountability mechanisms, which further strengthen overall political capacity	Broader discussions on accountability and learning can also be found in Dunlop and Radaelli (2018b) and empirical cases (Baxter et al. 2017; Højlund 2015; Schillemans and Smulders 2015)

depends heavily on the existing capacity for evaluation, adaptation, and implementation.

This review suggests that understanding policy learning requires examining paradigm shifts (belief and value change), knowledge acquisition, and capacity development. By taking an alternative perspective on learning outcomes in terms of enhanced capacities, we can better understand how organizations translate lessons into improved crisis management capacity. This perspective helps resolve the learning paradox by showing how capacity both enables and emerges from learning processes.

### 3 | Analytical Framework and Methodology

While policy learning and policy capacity are fundamentally interrelated—with learning contributing to the development of governance competencies—this study does not seek to capture the entire spectrum of policy capacity and policy learning dynamics. Instead, it adopts a focused analytical framework for empirical analysis, drawing on Heikkila and Gerlak’s (2013) process model of learning, which conceptualizes policy learning through four key phases: information collection, analysis, interpretation, and dissemination.

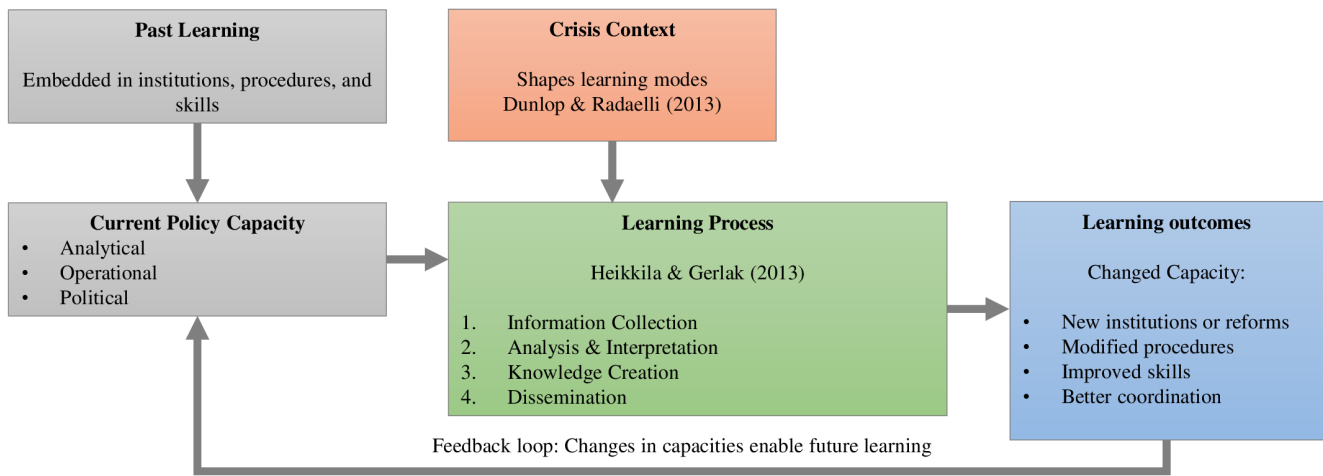
This study examines the cases of Hong Kong and Singapore, analyzing how these governments applied lessons from the 2003 SARS outbreak to manage COVID-19. The cases provide comparative insights into how policy learning translated into new institutions, rules, and processes—manifestations of policy capacity—shaping institutional responses, knowledge adaptation, and governance mechanisms in public health policy.

#### 3.1 | Analytical Framework

To examine how policy capacity both emerges from and facilitates policy learning, we develop an analytical framework that synthesizes insights from policy learning and capacity literature. Our framework builds on a crucial insight from organizational learning research: while knowledge acquisition may be the primary outcome of learning at the individual level (Nass 1994), learning at organizational and systemic levels manifests primarily through enhanced capacities. As Sheikh and Abimbola (2021) and Zaki and Wayenberg (2023) emphasize, this multi-level nature of learning requires attention to how individual knowledge acquisition is supported by organizational and systemic capacities.

Our framework, illustrated in Figure 1, captures the cyclical relationship between learning processes and capacity development in a crisis context. The learning process begins with experience and feedback, which scholars widely recognize as fundamental to policy learning (Deutsch 1966; Hecló 1974). However, feedback mechanisms themselves depend on existing capacities—particularly for evaluation and accountability—at both organizational and systemic levels.

Drawing on Heikkila and Gerlak’s (2013) process model, we identify four key phases of policy learning: information collection, analysis, interpretation (Lee et al. 2020; Moynihan 2005),



**FIGURE 1** | Policy learning process and policy capacity. This figure offers a normative, macro-level depiction of the reciprocal relationship between policy capacity and policy learning. While the empirical evidence presented in this paper illustrates only a select subset of these potential connections, the analytical framework is deliberately designed to accommodate broader hypothesis generation. In other words, the figure does not exhaustively represent all possible micro-level processes and causal pathways. Future research is encouraged to explore these additional dimensions, thereby extending and refining our understanding of how policy capacity and learning co-evolve.

and dissemination (Elliott 2008). Each phase both requires and potentially enhances different forms of capacity. Information collection demands robust data-gathering systems, while analysis requires technical expertise and analytical frameworks. Interpretation involves collaborative sense-making capabilities, and dissemination needs effective knowledge-sharing mechanisms.

The framework recognizes that learning occurs within specific crisis contexts that shape both capacity requirements and learning opportunities (Dunlop and Radaelli 2013). During acute crisis phases, organizations may need a strong operational capacity for reflexive learning and rapid response. In post-crisis periods, analytical capacity becomes crucial for more deliberative learning and systematic evaluation.

The cyclical nature of our framework highlights how past learning becomes embedded in current capacities, which then enable or constrain future learning opportunities. This builds on Capano et al.'s (2020) conceptualization of policy capacity as the institutionalization of past learning. The framework identifies five key elements in this learning-capacity cycle:

1. *Past Learning and Current Capacity*: Previous experiences shape existing analytical, operational, and political capacities across individual, organizational, and systemic levels.
2. *Crisis Context*: The nature of the crisis influences both learning modes and capacity requirements, affecting how organizations can collect, analyze, and act on information.
3. *Learning Process*: Organizations engage in systematic information collection, analysis, interpretation, and dissemination, with each phase requiring and potentially enhancing different capacities.
4. *Learning Outcomes*: Learning manifests as enhanced capacities across multiple dimensions, creating new capabilities for future crisis management.

5. *Feedback Loop*: Ongoing interaction between capacity development and learning processes shapes how organizations adapt and improve over time.

This framework guides our comparative analysis of Hong Kong and Singapore by highlighting key aspects of the learning-capacity relationship to examine: how existing capacities shaped crisis response and learning opportunities, how learning processes unfolded during crises, and how learning outcomes became embedded as enhanced organizational capacities.

### 3.2 | Methodology

To examine how policy capacity both enables and emerges from learning processes, we employ a comparative case study approach. This method is particularly well-suited for investigating complex, context-specific phenomena and identifying patterns across different settings (George and Bennett 2005). Comparative case studies have proven valuable in both policy learning research (Sabatier 1988) and policy capacity studies (Craft and Howlett 2012; Tan 2019; Yan et al. 2023), making this approach appropriate for our investigation of the learning-capacity relationship.

Our selection of Hong Kong and Singapore is informed by both theoretical and practical considerations. These city-states share important characteristics as small, open economies with strong state capacity and track records of effective governance (Lam 2000). However, they differ meaningfully in their political systems, administrative structures, and crisis management approaches (Woo 2020). These controlled similarities and differences provide an ideal comparative setting for examining how different dimensions of policy capacity shape learning processes.

The study focuses on these jurisdictions' responses to two sequential crises: the 2003 SARS outbreak and the COVID-19 pandemic. This temporal sequence allows us to trace how learning



from SARS manifested as enhanced capacities that subsequently influenced COVID-19 responses. Following Stake (2022), our case study is instrumental in nature, primarily focused on refining the theoretical understanding of the relationship between policy learning and capacity, with the specific cases serving as vehicles for theory development.

Our data collection draws on multiple secondary sources to ensure robust triangulation. Primary sources include government documents such as the SARS Expert Committee Report (2003), Quarantine and Prevention of Disease Ordinance, Centre for Health Protection reports, Infectious Diseases Act 1976, and National Centre for Infectious Diseases reports. We supplement these with policy briefs, press releases, and government orders that help trace post-SARS reforms. Additionally, we analyze academic studies and media coverage to provide broader context and independent assessments of policy developments.

The analysis proceeds through several stages, employing a thematic analysis approach to identify patterns in how policy capacity influences learning processes. First, we examine existing policy capacities and skills before each crisis, including public health infrastructure and crisis management frameworks. Second, we analyze crisis management processes and outcomes, focusing on containment measures, communication strategies, and coordination mechanisms. Third, we trace evaluation and feedback processes, including expert committee reviews and public inquiries. Finally, we examine how learning outcomes became institutionalized through reforms to public health laws, the creation of new agencies, and changes to standard operating procedures. Throughout our analysis, we pay particular attention to how different dimensions of policy capacity—analytical, operational, and political—shaped learning processes and outcomes. This includes examining how capacity constraints affected crisis response, how learning processes enhanced different forms of capacity, and how these enhanced capacities influenced subsequent crisis management capabilities.

We acknowledge several limitations in our approach. Our reliance on secondary data means we cannot fully trace micro-level learning mechanisms, which would require primary data collection through interviews and ethnographic research. Additionally, the small number of cases limits generalizability. However, following Miles and Huberman (1994) and Yin (2017), we employ several strategies to ensure validity and reliability, including triangulation across different data sources and maintaining a clear chain of evidence.

Despite these limitations, our comparative analysis provides valuable insights into how policy learning and capacity development interact during crises. By examining these dynamics through the policy capacity framework, we contribute to both the theoretical understanding of policy learning processes and practical knowledge about building effective learning systems in the public sector.

## 4 | Comparative Case Analysis

This section presents a comparative analysis of Hong Kong and Singapore's experiences with SARS and COVID-19. These

sequential crises provide an ideal setting to trace how learning outcomes manifest as enhanced capacities while also showing how existing capacities shape learning opportunities. Through the lens of our analytical framework, we examine how different dimensions of capacity—analytical, operational, and political—influenced crisis responses and evolved through learning processes. The comparison of these two city-states is particularly instructive as they share similar administrative traditions and initial conditions but experience different capacity development trajectories.

### 4.1 | Past Learning Embedded in Policy Capacities During the SARS Outbreak

During the SARS outbreak, both Hong Kong and Singapore faced significant challenges due to limitations in their existing policy capacities, particularly in their legislative frameworks and institutional arrangements. In Hong Kong, the outdated Quarantine and Prevention of Disease Ordinance (QPDO), established in 1936, lacked provisions for key measures such as contact tracing and comprehensive mobility restrictions (Choi and Lam 2009). The ordinance's focus on quarantining ships and enforcing sanitary measures at ports reflected its colonial-era origins but proved inadequate for modern public health challenges. Moreover, the city's fragmented health data systems, with poor integration between the Hospital Authority and Department of Health databases, impeded timely data analysis and decision-making (SARS-expertcom 2003).

Singapore entered the SARS crisis with a more modern legislative framework through its Infectious Diseases Act (IDA), introduced in 1976, but still encountered significant limitations. While the IDA had undergone periodic updates in response to smaller outbreaks like dengue, the SARS crisis revealed crucial gaps in information sharing and coordination among public health agencies (Infectious Diseases Act—Singapore Statutes Online 1977; Kian and Lateef 2004). These limitations particularly affected rapid contact tracing capabilities and public communication effectiveness during the initial outbreak phase.

### 4.2 | Learning Process

The crisis triggered intensive learning processes in both cities, primarily through robust evaluation and feedback mechanisms. Both jurisdictions demonstrated strong accountability systems, as reflected in their high World Bank Accountability indicator scores (Figure 2), which enabled thorough evaluation processes. Hong Kong's government commissioned expert reports that provided critical feedback on its fragmented data systems and outdated legislative frameworks. The introduction of the Principal Officials Accountability System (POAS) in 2002 enhanced the responsibility of government officials and facilitated comprehensive policy review (C. Cheung 2003). These evaluations led to significant reforms, including updates to the QPDO and the modernization of public health infrastructure (Burns 2021).

Singapore's learning process was characterized by a more integrated approach, combining domestic evaluation with international collaboration. The government partnered with



**FIGURE 2** | World Bank Good Governance Index—scores for accountability for Singapore and Hong Kong.

organizations like WHO and the U.S. CDC, demonstrating its commitment to comprehensive learning and improvement (Oberholtzer et al. 2004). This international engagement provided additional perspectives and expertise that informed Singapore's capacity development efforts.

The evaluation bodies in both city-states engaged in extensive information collection about the government response and translated them into tangible reforms that were taken up by the respective governments (Chan and Koh 2006; A. B. Cheung and Low 2023; Matus et al. 2023; SARS-Expertcom 2003; Woo 2020).

### 4.3 | Learning Outcomes as Changes in Capacities

These learning processes manifested as significant institutional developments in both cities, though with different emphases. Hong Kong established several key institutions: the Centre of Health Protection (CHP), Infectious Disease Control Training Centre (IDCTC), and Stanley Ho Centre for Emerging Infectious Diseases (CEID). The CHP transformed operational capacity by improving coordination between government branches and enhancing information flow. The IDCTC strengthened analytical capacity at the individual level through healthcare professional training, while CEID enhanced organizational and systemic analytical capacities through research and consultancy services (CEID, 2003).

Singapore's institutional response focused more heavily on technological solutions and integrated systems. The government developed sophisticated contact-tracing systems and improved IT infrastructure for information collection and dissemination. Key innovations included the Infectious Disease Alert

and Clinical Database System and e-Quarantine Management System (Goh et al. 2006). The reorganization of the Executive Group into the Homeland Crisis Executive Group (HCEG) significantly enhanced operational capacity for crisis coordination (Low 2020). This systematic approach to capacity building reflected Singapore's emphasis on whole-of-government coordination and technological innovation.

### 4.4 | Enhanced Capacities During the COVID-19 Crisis and Future Learning

When COVID-19 emerged, both cities entered the crisis with significantly enhanced capacities developed through their SARS experience, though these were tested in markedly different ways. In Hong Kong, the Centre for Health Protection demonstrated the value of post-SARS capacity development, serving as the primary coordination agency for the government's response. The integrated health data systems and modernized disease control protocols enabled more rapid information sharing and decision-making compared to the SARS period. The IDCTC's trained healthcare professionals provided a strong foundation for implementing standardized infection control measures across the healthcare system.

Singapore similarly entered the COVID-19 crisis with robust capabilities, particularly in surveillance and coordination. The HCEG effectively mobilized its whole-of-government approach, while advanced contact tracing systems built on SARS-era innovations enabled rapid case detection and containment. The National Centre for Infectious Diseases, established post-SARS, provided crucial technical expertise and coordination capabilities for managing the outbreak.

However, COVID-19 revealed how enhanced technical capacities alone were insufficient for effective crisis response. In Hong Kong, political tensions significantly constrained the government's ability to implement control measures effectively. Despite strong analytical and operational capabilities, the government's response was criticized as slow and reactive, with transparency issues undermining public confidence (Hartley and Jarvis 2020). The concurrent pro-democracy protests created additional challenges for crisis management, highlighting how political capacity constraints can limit the effectiveness of technical and operational capabilities. This situation demonstrated the crucial role of political capacity in enabling the effective deployment of other capacities.

Singapore's experience revealed different capacity challenges. While its technical response demonstrated the value of post-SARS learning, the outbreak in migrant worker dormitories exposed significant blind spots in its surveillance systems and revealed limitations in inclusive crisis communication (Woo 2020). The government's top-down, technocratic approach, though efficient in many respects, created tensions with civil society and raised concerns about social equity. This experience highlighted how enhanced analytical and operational capacities must be complemented by attention to social inclusion and comprehensive surveillance.

Both cities' COVID-19 experiences triggered new learning processes that extended beyond technical capabilities. Hong Kong had to develop new approaches to cross-border coordination with mainland China while attempting to rebuild public trust. The government's efforts to adapt its communication strategies and enhance transparency reflected recognition of the need to strengthen political capacity alongside technical capabilities.

Singapore's learning focused on addressing the gaps revealed by the migrant worker crisis. The government developed new protocols for vulnerable population surveillance and enhanced its community engagement processes. These adaptations demonstrated how even strong existing capacities require continuous refinement and expansion to address emerging challenges.

#### 4.5 | Cross-Crisis Analysis

The comparison of SARS and COVID-19 responses reveals several key patterns in the learning-capacity relationship, offering important insights into how different dimensions of capacity both enable and emerge from learning processes (Table 2). First, the evolution of analytical capacity shows a clear progression in both cities, though with different emphases and outcomes. Hong Kong's development from fragmented data systems during SARS to integrated surveillance capabilities during COVID-19 demonstrates how learning outcomes become embedded as enhanced capacity. Similarly, Singapore's progression from basic contact tracing to sophisticated digital systems illustrates how initial capacity investments enable more advanced learning and capability development.

The development of operational capacity followed different trajectories in the two cities. Hong Kong's establishment of the CHP post-SARS created a central coordination mechanism that

proved valuable during COVID-19, yet its effectiveness was constrained by political factors. Singapore's HCEG, in contrast, maintained strong operational effectiveness across both crises, successfully coordinating multi-agency responses. This difference highlights how operational capacity, while crucial, depends heavily on supporting political and institutional contexts.

Perhaps most significantly, the evolution of political capacity shows the most striking divergence between the two cities. During SARS, both cities benefited from high levels of public trust and compliance with government measures (Hung 2003). However, by the time of COVID-19, Hong Kong faced severe political capacity constraints that limited its ability to implement effective control measures, despite its enhanced technical capabilities. Singapore maintained stronger political capacity throughout both crises, though the migrant worker dormitory outbreak revealed limitations in its inclusive governance approach.

This temporal comparison yields three critical insights about the learning-capacity relationship. First, capacity development is not a linear process—while both cities successfully addressed many capacity gaps identified during SARS, COVID-19 exposed new vulnerabilities, particularly in areas like cross-border coordination and inclusive crisis communication. Second, the interdependence of different capacity types becomes evident—strong analytical or operational capacity alone proves insufficient without corresponding political capacity to enable effective implementation. Third, the institutional embedding of learning outcomes varies significantly based on political and administrative contexts.

#### 4.6 | Synthesis

The comparative analysis of Hong Kong and Singapore's experiences across the SARS and COVID-19 crises provides strong support for our theoretical framework while revealing important nuances in the relationship between policy learning and capacity development. The cases demonstrate how initial capacities shape learning opportunities while learning outcomes manifest as enhanced capabilities. However, they also reveal how this relationship is mediated by political and institutional factors that can either enable or constrain the effectiveness of enhanced capacities.

Three key theoretical implications emerge from this analysis. First, the cases support our alternative view of policy learning as changes in capacities rather than just knowledge accumulation. The development of specific institutional capabilities, technological systems, and coordination mechanisms in both cities demonstrates how learning becomes embedded in operational practices and structures. Second, the analysis reveals the crucial role of political capacity as an enabling condition for other forms of capacity development. Hong Kong's experience particularly highlights how political capacity constraints can limit the effectiveness of enhanced analytical and operational capacities.

Finally, the cases illuminate the dynamic nature of the learning-capacity relationship. While enhanced capacities from SARS learning proved valuable during COVID-19, both cities had to

**TABLE 2** | Evolution of policy capacities from SARS to COVID-19.

Location	SARS (2003)	COVID-19 (2020)
Hong Kong	<p><i>Capacity constraints:</i></p> <ul style="list-style-type: none"> <li>• Fragmented health data systems</li> <li>• Outdated quarantine ordinance (1936)</li> <li>• Limited emergency communication</li> </ul> <p><i>Capacity enablers post-SARS:</i></p> <ul style="list-style-type: none"> <li>• Establishment of CHP</li> <li>• Enhanced disease control protocols</li> <li>• Improved risk communication</li> </ul>	<p><i>New capacity constraints:</i></p> <ul style="list-style-type: none"> <li>• Cross-border data integration</li> <li>• Border control coordination</li> <li>• Eroded public trust</li> </ul> <p><i>Enhanced capacities from SARS:</i></p> <ul style="list-style-type: none"> <li>• Improved surveillance (CHP)</li> <li>• Better infection control</li> <li>• Established communication</li> </ul>
Singapore	<p><i>Capacity constraints:</i></p> <ul style="list-style-type: none"> <li>• Limited contact tracing</li> <li>• Inter-agency coordination gaps</li> <li>• Communication challenges</li> </ul> <p><i>Capacity enablers post-SARS:</i></p> <ul style="list-style-type: none"> <li>• Enhanced surveillance</li> <li>• Creation of HCEG</li> <li>• Improved engagement</li> </ul>	<p><i>New capacity constraints:</i></p> <ul style="list-style-type: none"> <li>• Migrant worker blind spots</li> <li>• Large-scale quarantine issues</li> <li>• Inclusive communication gaps</li> </ul> <p><i>Enhanced capacities from SARS:</i></p> <ul style="list-style-type: none"> <li>• Advanced contact-tracing</li> <li>• Efficient coordination</li> <li>• Strong public compliance</li> </ul>

engage in new learning processes to address novel challenges. This suggests that effective crisis response requires not just strong existing capacities but also the ability to continue learning and adapting as circumstances change.

These findings have important practical implications for governments seeking to enhance their crisis management capabilities. They suggest the need for balanced development across all capacity dimensions, with particular attention to political capacity as a crucial enabling factor. They also highlight the importance of maintaining learning capabilities even after significant capacity enhancement, as new crises may present novel challenges that require additional adaptation. Table 3 summarizes the interrelationships between policy learning and capacity development across different dimensions and phases of crisis response.

## 5 | Discussion

Our comparative analysis of Hong Kong and Singapore provides rich empirical evidence of how policy capacity both enables and emerges from learning processes, demonstrating what Dunlop and Radaelli (2018a, 2018b) describe as the multi-faceted nature of policy learning. The cases reveal how initial capacity constraints shaped learning opportunities while learning outcomes manifested as enhanced capabilities for future crisis management.

The cases demonstrate that policy learning outcomes materialize primarily as enhanced capacities rather than just accumulated knowledge, supporting recent theoretical developments (Capano et al. 2020). Both cities' experiences show how learning became institutionalized through new organizational structures, procedures, and capabilities. For instance, Hong Kong's establishment of the Centre for Health Protection and Singapore's development of integrated surveillance systems represent concrete manifestations of learning outcomes as enhanced capacity. This finding extends beyond May's (1992) traditional focus on knowledge accumulation to encompass the development of practical

capabilities and skills. Figure 3 summarizes the findings from the empirical analysis.

However, the cases also reveal the paradoxical nature of this relationship: existing capacities significantly shaped each city's ability to learn from crisis experiences. As Heikkilä and Gerlak (2013) suggest, learning processes require specific institutional capabilities for information collection, analysis, and dissemination. Singapore's strong initial operational capacity, particularly in inter-agency coordination, enabled more comprehensive learning during SARS. In contrast, Hong Kong's fragmented health data systems initially constrained its ability to gather and analyze crisis information effectively, though these limitations themselves became targets for subsequent capacity enhancement.

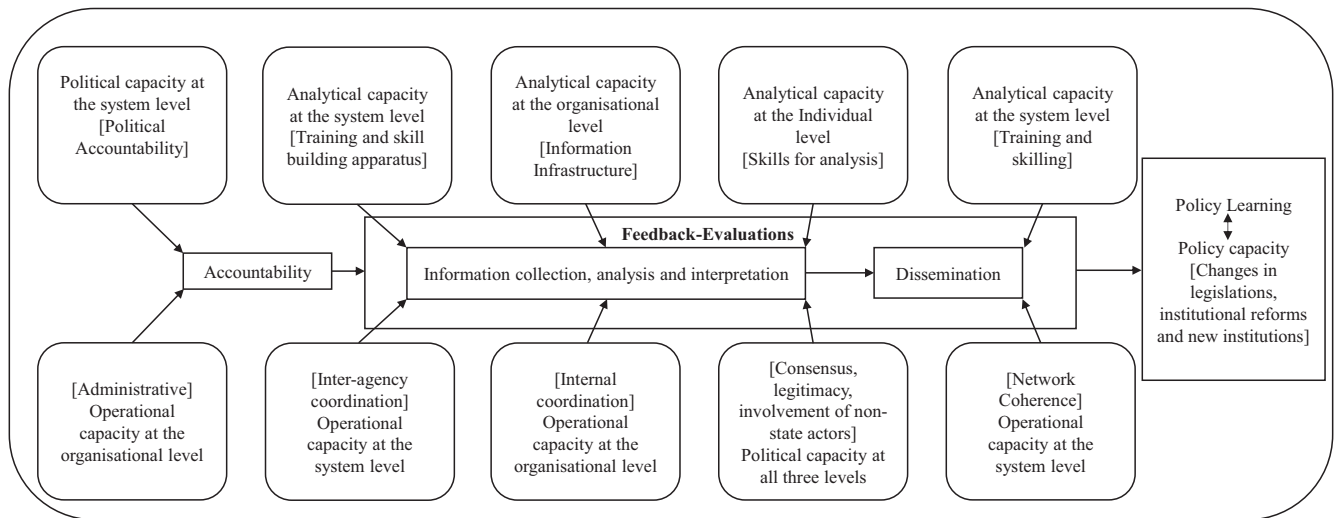
The role of political capacity emerged as particularly crucial in this paradoxical relationship. While both cities developed strong analytical and operational capabilities following SARS, their divergent political capacity trajectories significantly influenced their ability to deploy these enhanced capabilities during COVID-19. This finding aligns with Boin et al.'s (2008) emphasis on the importance of political legitimacy and trust in crisis management. Singapore's maintained political capacity enabled more effective implementation of technical capabilities, while Hong Kong's eroded political trust limited the effectiveness of its enhanced analytical and operational capacities (Hartley and Jarvis 2020).

Our analysis makes several important contributions to the theoretical understanding of policy learning and capacity development. First, we advance the idea of policy learning as policy capacity by demonstrating how learning outcomes manifest primarily as enhanced capacities. This extends beyond traditional views of policy learning focused on knowledge acquisition (Bennett and Howlett 1992; May 1992) to encompass the development of concrete organizational capabilities. As our cases demonstrate, learning becomes embedded in institutional structures and practices, supporting Capano et al.'s (2020) argument about the institutionalization of learning outcomes.



**TABLE 3** | Interrelationship between policy capacity and learning from the empirical case.

Policy learning	Description	Policy capacity	Hong Kong	Singapore
Past learning as capacity	Institutional memory and policy developments from previous health crises before SARS	Policy learning from earlier crises (e.g., tuberculosis, cholera) shaped capacities in operational and legislative frameworks	The Quarantine and Prevention of Disease Ordinance (1936) was enacted to control infectious diseases but became outdated by the time of SARS	The Infectious Diseases Act (1976) was introduced following past disease outbreaks (e.g., tuberculosis) to centralize outbreak response but lacked updates
Evaluation	Feedback mechanisms identify gaps in the system and implement reforms	Administrative and political accountability in the form of operational and political capacity at the organizational and system levels, respectively	The SARS Expert Committee review was a result of improved accountability through POAS, focusing on better preparedness	Evaluations were a result of strong accountability in Singapore. It led to amendments in the Infectious Diseases Act, emphasizing stronger inter-agency coordination and public communication
Information collection and analysis	Mechanisms for gathering and analyzing data during crises	Analytical capacity (skills for analysis, process and system for data collection) at the individual, organizational, and system levels. Operational capacity (internal and inter-agency coordination) at the organizational level and the system level	Fragmented data systems during SARS led to the later integration of databases and enhanced analytical capacity through CHP	Contact tracing systems were developed post-SARS, improving operational and analytical capacities, especially in inter-agency coordination and data sharing
Interpretation	Ability to interpret collected information and apply it to decision-making processes	Political capacity (consensus, legitimacy, involvement of non-state actors) at all levels	Involvement of non-state actors in expert evaluations, enhancing legitimacy and consensus-building in crisis response	Stronger political capacity fostered legitimacy and public trust, though gaps emerged during COVID-19 in handling vulnerable populations (e.g., migrant workers)
Dissemination	Sharing of information within and between agencies, and with the public	Analytical capacity (dissemination system), operational capacity (network coherence) at the system level	Improvements in risk communication and public health messaging via CHP; focus on data dissemination and public health awareness	Enhanced IT infrastructure, including the e-Quarantine Management System, facilitating better information dissemination and communication between agencies



**FIGURE 3** | Interrelationship between policy capacity and policy learning emerging from the empirical analysis. Following our normative analytical framework in Figure 1—focusing on macro-level processes and the interplay between policy capacity and policy learning—the figure above highlights how specific policy capacities at different levels align with each phase of the learning process in the given crisis context of SARS and COVID-19. We emphasize that any omission or limited detail on particular capacities at certain levels does not diminish their importance. For instance, while our analysis addresses political capacity in broad terms, it remains pivotal for steering the learning process and preventing counter-productive lesson-drawing. Likewise, operational capacity at the individual level (e.g., planning and coordination) can significantly facilitate policy learning, both during and after crises, even though these facets did not distinctly emerge in our empirical examination.

Second, our findings reveal the crucial interdependence of different capacity types in enabling effective learning. While Wu et al.'s (2015) framework distinguishes between analytical, operational, and political capacities, our analysis shows how these capacities interact and mutually reinforce each other during crisis learning. This builds on Lodge and Wegrich's (2014) work on capacity interactions by demonstrating how strengths in one capacity area can either amplify or be constrained by capabilities in others. For instance, Singapore's strong political capacity enabled better utilization of its enhanced analytical and operational capabilities, while Hong Kong's political capacity constraints limited the effectiveness of its technical improvements.

Third, our analysis highlights the temporal dynamics of capacity development through sequential crises. Building on Moynihan's (2008) work on crisis learning, we show how capacity enhancement from one crisis shapes learning opportunities in subsequent crises. However, we extend this understanding by demonstrating that capacity development is not linear—while some capacities may be enhanced through learning, new challenges may expose or create different capacity gaps, as evidenced in both cities' COVID-19 responses.

Our findings have significant implications for policymakers and crisis managers. First, they suggest the need for balanced development across all capacity dimensions. As Howlett and Ramesh (2016) argue, capacity building requires sustained investment in multiple areas. Our analysis particularly emphasizes the importance of political capacity as an enabling condition for other forms of capacity development. This suggests that governments should pay attention not only to technical capabilities but also to maintaining public trust and political legitimacy.

Second, the cases demonstrate the importance of institutional design in supporting learning capabilities. Following Pahl-Wostl

et al. (2013) emphasis on adaptive capacity, our analysis suggests that governments should create structures that facilitate continuous learning and adaptation. This includes establishing robust feedback mechanisms, maintaining strong accountability systems, and ensuring effective knowledge dissemination across organizational boundaries.

Third, our findings highlight the need for inclusive governance approaches in crisis management. As demonstrated by both cities' COVID-19 experiences, effective crisis response requires attention to diverse stakeholder needs and comprehensive surveillance systems. This aligns with recent scholarship emphasizing the importance of inclusive crisis management approaches (Sheikh and Abimbola 2021).

Our analysis faces several important limitations that qualify its findings. Primary among these is our reliance on secondary data, which limits our ability to trace micro-level learning mechanisms, particularly how individual actors within organizations translate learning into enhanced capabilities. This constraint particularly affects our understanding of operational capacity at the individual level, which Howlett and Ramesh (2016) identify as crucial for policy success. Additionally, while our focus on two city-states with similar administrative traditions but different political systems provides useful comparative insights, it also limits generalizability to other institutional contexts.

These limitations notwithstanding, our analysis provides substantial evidence for the recursive relationship between policy learning and capacity development. As Lodge and Wegrich (2014) argue, while capacity development pathways are heavily influenced by institutional contexts, common patterns can emerge that inform both theory and practice. Our study demonstrates how different dimensions of capacity both enable and emerge

from learning processes while highlighting the crucial role of political capacity in facilitating effective crisis response.

## 6 | Conclusion

This study illuminates the paradoxical relationship between policy capacity and learning: governments need certain capacities to learn effectively, yet these same capacities often emerge from previous learning experiences. Through a comparative analysis of Hong Kong and Singapore's responses to SARS and COVID-19, we demonstrate how policy learning manifests as enhanced analytical, operational, and political capacities, while these capacities simultaneously shape future learning opportunities.

Our analysis of the two city-states reveals several key insights. First, learning outcomes materialize primarily as changes in capacities rather than just accumulated knowledge. This is evidenced by how both cities translated SARS experiences into concrete institutional capabilities, such as Hong Kong's Centre for Health Protection and Singapore's integrated surveillance systems. Second, the effectiveness of learning processes depends heavily on existing capacities, particularly political capacity. Singapore's maintained political trust enabled more effective deployment of enhanced technical capabilities during COVID-19, while Hong Kong's eroded political capacity constrained its response despite strong analytical and operational capabilities. Third, capacity development is not linear—while both cities successfully addressed many capacity gaps identified during SARS, COVID-19 exposed new vulnerabilities, particularly in areas like cross-border coordination and inclusive crisis management.

These findings advance our theoretical understanding of policy learning by showing how it manifests through enhanced capabilities rather than just knowledge acquisition. They also highlight the interdependence of different capacity types; particularly how political capacity enables or constrains the effectiveness of analytical and operational capabilities. For practitioners, our analysis emphasizes the importance of balanced capacity development and maintaining strong political trust alongside technical capabilities. While our focus on two city-states limits generalizability, the study provides valuable insights into how governments can enhance their capacity for learning and adaptation in an increasingly complex world.

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