

Curriculum Transformation, Educational Governance, and Future Skills Development: A Comparative Study of Competency-Based Education Reform in Singapore and Canada, 2020–2026

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ABSTRACT

This article examines competency-based curriculum reform and educational governance through a comparative analysis of Singapore and Canada between 2020 and 2026. The study argues that competency-based education (CBE) has evolved from a curriculum redesign initiative into a broader governance strategy linking future skills development, institutional capacity, teacher professionalism, educational equity, and national human capital transformation. Singapore and Canada provide analytically significant comparative cases because both education systems have pursued competency-oriented reforms while operating under distinct governance structures. Singapore employs a centralized, state-coordinated educational reform model emphasizing future readiness, digital skills, and national innovation capacity. Canada represents a decentralized federal educational landscape in which provinces implement competency-based approaches through diverse curricular and pedagogical pathways. The findings indicate that competency-based reform improves educational resilience and learner adaptability only when curriculum transformation is aligned with teacher capacity, assessment redesign, institutional coordination, and equity safeguards. This article contributes to educational research literature by conceptualizing competency-based reform as a socio-institutional governance process rather than a purely pedagogical innovation.

Keywords: competency-based education; curriculum reform; educational governance; comparative education; Singapore; Canada; future skills; teacher capacity; assessment reform; educational policy

INTRODUCTION

Educational systems worldwide are undergoing substantial transformation in response to technological disruption, labor-market restructuring, climate uncertainty, demographic shifts, and changing expectations regarding citizenship and human capability. Between 2020 and 2026, debates concerning future skills, digital literacy, socio-emotional learning, creativity, and adaptive learning intensified as governments confronted the limitations of industrial-era curriculum structures. The COVID-19 pandemic accelerated concerns regarding educational resilience, learner agency, and curriculum flexibility, while also exposing institutional inequalities in access, digital capacity, and instructional continuity (OECD, 2023; UNESCO, 2024).

This study argues that competency-based education (CBE) should be understood not merely as a pedagogical innovation but as a governance-oriented educational transformation. Competency-based reform redefines the relationship among curriculum, assessment, teacher professionalism, institutional accountability, and social development. Unlike traditional content-centered models emphasizing memorization and standardized knowledge transmission, competency-based systems prioritize transferable capabilities such as critical thinking, communication, collaboration, creativity, digital literacy, problem-solving, and lifelong learning. Consequently, CBE reshapes how educational systems define success, allocate responsibility, evaluate learning, and prepare students for uncertain futures.

Singapore and Canada provide analytically valuable comparative cases for examining these transformations. Singapore represents a highly centralized educational governance model characterized by strong state coordination, long-term strategic planning, national curriculum alignment, and future-oriented human capital development. Educational reforms such as “Learn for Life,” twenty-first-century competencies, and AI-supported educational innovation reflect Singapore’s emphasis on adaptability, innovation, and economic competitiveness. Canada, by contrast, represents a decentralized educational governance model in which provinces possess substantial curricular authority. Provinces such as British Columbia and Ontario have implemented competency-based curriculum frameworks emphasizing personalized learning, inquiry, inclusion, and learner-centered pedagogy.

The global institutional context reinforces the importance of this comparison. UNESCO’s Futures of Education initiative emphasizes that education systems must move beyond narrow academic achievement toward holistic capability development and social resilience (UNESCO, 2021). OECD Learning Compass frameworks similarly prioritize transformative competencies, learner agency, and future readiness (OECD, 2023). World Bank analyses further stress that human capital development increasingly depends on adaptive learning systems capable of preparing students for rapidly changing economic and technological conditions (World Bank, 2023).

Existing educational scholarship has contributed significantly to debates on competency-based reform. Fullan and Quinn (2020) argue that deep learning requires system coherence, collaborative professionalism, and learner-centered pedagogy. Darling-Hammond et al. (2020) emphasize that competency-based systems can improve equity and engagement when assessment, instruction, and curriculum are aligned. Priestley and Biesta (2019) highlight the importance of curriculum as a socially and politically constructed process rather than a technical framework. Zhao (2020) argues that future-oriented education should prioritize creativity and learner diversity rather than standardized conformity. Other educational scholars emphasize that competency-based reform requires substantial institutional adaptation because traditional accountability systems often conflict with learner-centered pedagogies (Tobin & Tippett, 2021; Westbury, 2022).

However, current educational literature remains limited in several respects. While previous studies emphasize pedagogical innovation and learner engagement, they often under-theorize governance structures and institutional implementation. Other educational scholars focus on curriculum design but fail to explain how teacher capacity, assessment systems, and policy coordination shape implementation outcomes. Existing comparative educational research also remains limited in explaining how centralized and decentralized governance systems operationalize competency-based reform differently.

This article identifies six major research gaps. First, a theoretical gap persists concerning competency-based education as institutional governance rather than instructional reform alone. Second, an empirical gap concerns how curriculum reform interacts with teacher professionalism and assessment systems. Third, a comparative gap exists regarding centralized and decentralized implementation pathways. Fourth, an educational governance gap concerns coordination among ministries, schools, teachers, and assessment institutions. Fifth, a policy implementation gap concerns how future skills agendas are translated into classroom practice. Sixth, an institutional equity gap concerns whether competency-based systems support inclusive learning or reproduce inequality.

The novelty of this article lies in its comparative institutional analysis of competency-based reform in Singapore and Canada. Rather than evaluating curriculum change solely through pedagogical outcomes, the study conceptualizes CBE as a socio-institutional governance process linking educational policy, institutional coordination, teacher agency, assessment transformation, and human capital development. The article contributes theoretically by developing a framework connecting educational governance, curriculum transformation, teaching quality, learner adaptability, and social resilience.

The analytical framework proceeds through the following causal relationship: educational governance shapes curriculum reform capacity; curriculum reform influences teacher adaptation and assessment redesign; teacher and assessment transformation shape instructional quality; instructional quality affects learner competencies and equity; and competency development contributes to workforce readiness, social resilience, and human capital formation. The objective of this article is to examine how Singapore and Canada implemented competency-based curriculum reform between 2020 and 2026 and to evaluate how

governance structures, institutional capacity, and policy coordination influenced educational and developmental outcomes.

METHODOLOGY

This study employs a comparative educational governance methodology integrating comparative curriculum analysis, institutional policy analysis, and socio-educational interpretation. Singapore and Canada were selected because both are internationally recognized education systems pursuing competency-based reforms, yet they differ substantially in governance structure, policy coordination, institutional centralization, and implementation logic. Singapore represents a centralized educational governance model characterized by strong ministry coordination, nationally integrated curriculum frameworks, and state-led innovation strategies. Canada represents a decentralized educational governance environment in which provincial authorities exercise significant curricular autonomy, creating institutional diversity in competency-based implementation. The unit of analysis is the competency-based educational reform ecosystem, including curriculum frameworks, teacher professional development systems, assessment transformation, policy coordination mechanisms, digital learning integration, and equity-oriented educational outcomes.

The empirical basis consists of OECD education reports, UNESCO educational futures frameworks, provincial and national curriculum documents, institutional reform strategies, public educational performance indicators, teacher development policies, and peer-reviewed educational research published between 2020 and 2026. Analytical techniques combine cross-case institutional comparison, curriculum policy interpretation, and process-tracing analysis to identify causal mechanisms linking governance structures to curriculum implementation and learner outcomes. Triangulation is achieved by comparing curriculum frameworks, assessment policies, institutional reports, and comparative educational indicators. Ethical considerations concern curriculum standardization, learner surveillance through competency tracking systems, unequal access to personalized learning opportunities, and the risk of reducing education to labor-market utility. The principal limitation is that competency-based implementation remains uneven across institutions and provinces, making direct outcome comparison methodologically challenging. Nevertheless, the comparative framework enables robust analysis of how governance capacity shapes curriculum transformation.

Findings and Discussion

1. Educational Governance and Curriculum Reform Capacity

The first finding is that governance structure strongly shapes the implementation of competency-based curriculum reform. Singapore's centralized educational governance system enables relatively coherent national implementation. Curriculum redesign, teacher training, digital learning initiatives, and assessment adjustments are coordinated through the Ministry of Education and associated national institutions. This allows rapid alignment between policy priorities and institutional execution.

Canada's decentralized governance structure produces greater variation across provinces. British Columbia's competency-based curriculum framework emphasizes personalized learning, communication, critical thinking, and social responsibility, while Ontario and other provinces pursue related but distinct approaches. Decentralization allows contextual flexibility and local adaptation but also creates uneven implementation capacity and policy coherence.

The comparative evidence demonstrates that centralized systems can scale reform more rapidly because institutional coordination is stronger. However, decentralized systems may support greater pedagogical experimentation and responsiveness to local educational needs. Singapore's model demonstrates coherence and policy alignment, while Canada's model demonstrates pluralism and adaptive variation.

This finding supports comparative education scholarship arguing that governance structures mediate educational reform effectiveness (Fullan & Quinn, 2020). It also reflects OECD findings that system coherence influences policy implementation and institutional trust (OECD, 2023). The educational implication is that competency-based reform requires governance systems capable of balancing consistency with local professional autonomy.

2. Teacher Professionalism and Pedagogical Transformation

The second finding is that teacher professionalism mediates the relationship between curriculum reform and learning quality. Competency-based education requires substantial pedagogical transformation because teachers must move beyond content delivery toward facilitation, inquiry-based learning, formative assessment, collaborative learning, and interdisciplinary instruction.

Singapore has invested heavily in teacher professional development through centralized institutional support, digital learning initiatives, and structured pedagogical training. Teachers receive guidance on integrating future competencies into classroom practice. However, the centralized system may also create implementation pressure if teachers perceive reforms as externally mandated rather than professionally owned.

In Canada, teacher professionalism is more strongly associated with provincial and local educational cultures. Teachers often exercise greater curricular interpretation autonomy, particularly in inquiry-based and learner-centered approaches. This supports pedagogical innovation but may also create uneven implementation quality depending on local resources and professional learning opportunities.

The comparison reveals that competency-based reform depends on teacher interpretive capacity rather than curriculum documents alone. Teachers translate abstract competencies into classroom practice. Therefore, institutional investment in professional learning communities, collaborative planning, formative assessment literacy, and curriculum interpretation is essential.

This finding extends educational change literature by showing that competency-based systems succeed not through structural redesign alone but through professional capital formation. Teacher agency remains central even in highly digitized and policy-intensive educational environments.

3. Assessment Reform and Learning Legitimacy

The third finding is that competency-based reform requires assessment transformation because traditional examination systems often conflict with broader learning objectives. Competency-oriented curricula emphasize creativity, collaboration, critical reasoning, and adaptive problem-solving, yet many educational systems continue to prioritize standardized testing and high-stakes assessment.

Singapore has gradually expanded holistic assessment approaches and reduced emphasis on narrow examination ranking. However, strong societal expectations concerning academic performance continue to influence educational culture. This creates tension between future-oriented competency goals and traditional meritocratic assessment structures.

Canada's decentralized systems generally provide greater flexibility for formative assessment, portfolio evaluation, inquiry-based learning assessment, and competency tracking. However, assessment consistency may vary significantly across schools and provinces, raising questions concerning comparability and accountability.

The comparative evidence suggests that assessment systems shape the legitimacy of curriculum reform. If competency-based education is assessed through traditional content-focused examinations, instructional transformation remains limited. Conversely, assessment systems that support reflection, application, collaboration, and feedback can reinforce deeper learning.

This finding aligns with educational assessment scholarship emphasizing that evaluation systems structure pedagogical priorities (Darling-Hammond et al., 2020). The policy implication is that curriculum reform must be accompanied by assessment redesign and institutional accountability transformation.

4. Educational Equity, Human Capital, and Social Development

The fourth finding is that competency-based reform influences broader social and developmental outcomes through its effects on educational equity and human capital formation. Singapore's future-skills orientation supports workforce readiness, digital literacy, and innovation capacity. However, educational competition and shadow education pressures may limit equity gains if advantaged students access enriched learning opportunities more effectively.

Canada's competency-based approaches emphasize inclusion, learner diversity, and holistic development. These approaches may support broader educational equity when schools possess sufficient institutional resources and teacher capacity. However, decentralized governance can also produce disparities across regions and communities.

The comparative evidence demonstrates that competency-based reform can support social resilience and human capital development when educational systems integrate future skills with equity safeguards. Learners require not only technical competencies but also adaptability, collaboration, ethical reasoning, and civic capability.

This finding contributes to human capital and comparative education literature by showing that future-skills education is institutionally mediated. Educational systems do not produce adaptive citizens automatically through

curriculum reform. Outcomes depend on governance coordination, teacher professionalism, assessment legitimacy, and equitable institutional support.

The developmental implications are substantial. Educational systems capable of integrating competency-based learning with social inclusion may strengthen innovation capacity, democratic resilience, workforce adaptability, and long-term social cohesion.

Table 1. Comparative Matrix of Educational Governance, Institutional Capacity, and Learning Outcomes

Variable	Case 1: Singapore	Case 2: Canada	Empirical Evidence	Analytical Interpretati on
Governanc e Structure	Centralized national educational governance	Decentralize d provincial governance	Ministry- led reform strategies; provincial curriculum framework s	Governance structure shapes reform coherence
Curriculu m Orientatio n	Future readiness and national innovation capacity	Personalized learning and learner- centered competencies	Competenc y-based curriculum documents	Different curriculum logics reflect institutional priorities
Teacher Developme nt	Structured national professional learning	Locally and provincially varied professional development	Teacher policy and institutiona l reports	Teacher capacity mediates curriculum implementati on
Assessment Reform	Gradual movement toward holistic evaluation	Greater flexibility for formative and portfolio assessment	Assessmen t policy reforms	Assessment systems determine reform legitimacy
Institution al Coordinati on	Strong ministry- school alignment	Diverse provincial implementati on pathways	Educationa l governance reports	Coordination affects implementati on consistency
Equity Challenge	Competition and shadow education inequality	Regional and institutional resource disparities	OECD and national equity indicators	Competency reform interacts with structural inequality
Digital Learning Integration	National digital learning and AI initiatives	Mixed provincial digital integration models	Educationa l technology policy reports	Technology effectiveness depends on institutional capacity
Human Capital Orientatio	Innovation and economic competitiven	Holistic learner adaptability	Workforce and education	Educational goals shape development

n	ess	and inclusion	policy documents	al outcomes
Educational Risk	Over-standardization and reform pressure	Uneven implementation and accountability variation	Comparative policy analyses	Risks reflect governance structures
Social Development Outcome	Future-oriented workforce capability	Inclusive and adaptive citizenship development	OECD and UNESCO educational analyses	Curriculum reform shapes broader social resilience

The table demonstrates that Singapore and Canada represent two distinct but complementary pathways toward competency-based educational transformation. Singapore’s centralized system enables coherent and scalable implementation aligned with national economic priorities, while Canada’s decentralized approach allows contextual adaptation and broader pedagogical flexibility. The deeper analytical interpretation is that competency-based reform succeeds only when curriculum transformation is institutionally embedded through governance coordination, teacher professionalism, assessment redesign, and equity-oriented support structures.

Conceptual Framework

Competency-Based Educational Governance Framework

Educational Governance → Curriculum Transformation → Teacher Professional Capacity → Assessment Redesign → Learner Competency Development → Human Capital and Social Resilience

This framework conceptualizes competency-based education as a socio-institutional governance process rather than a narrow pedagogical reform. Educational governance determines reform direction, institutional coordination, funding priorities, and accountability structures. Curriculum transformation reshapes educational aims toward transferable competencies and future-oriented learning. Teacher professional capacity mediates the translation of curriculum into classroom practice. Assessment redesign legitimizes and reinforces competency-based learning. Learner competency development contributes to adaptable human capital, democratic participation, and long-term social resilience.

The framework contributes to educational research by demonstrating that future-skills education depends on institutional alignment rather than curriculum rhetoric alone. Educational transformation occurs through coordinated interaction among governance systems, professional actors, curriculum structures, and assessment cultures.

RESULTS & DISCUSSION

This section comprises the research results and discussion. Each finding must be supported by adequate data. Furthermore, the research findings should address the research questions or hypotheses through rigorous and in-depth analysis.

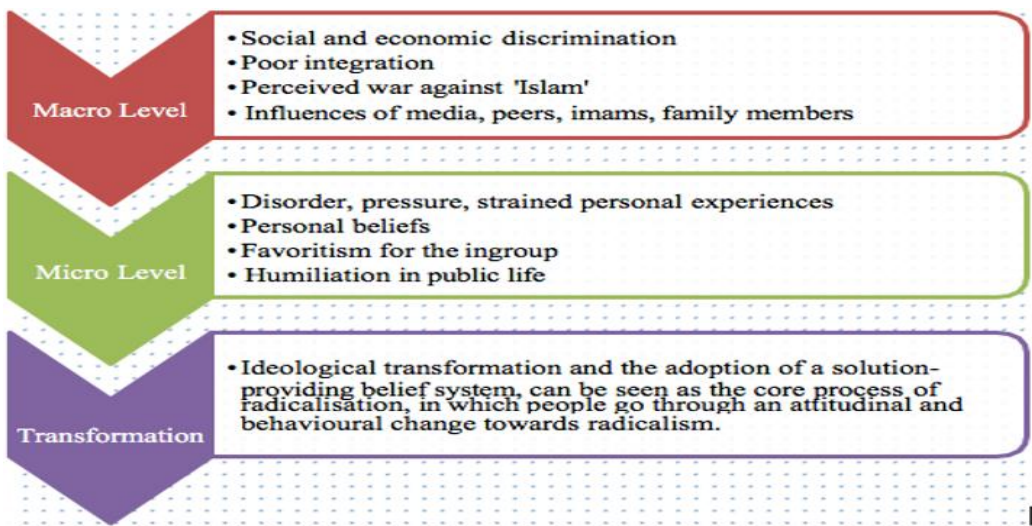


Tabel 1. (Contoh Tabel yang di beri nomor urut dan mencantumkan sumber rujukan)

		<i>Emotive</i>	
		<i>Stron</i>	<i>Wea</i>
<i>Cognitive</i>	<i>Close</i>	<i>Fixe</i>	<i>Inelasti</i>
	<i>Ope</i>	<i>Fir</i>	<i>Flexibl</i>

Sumber: Sartori, Giovanni. (2005). Parties and Party Systems: A Framework for Analysis

Gambar 1. (Contoh Tabel yang di beri nomor urut dan mencantumkan sumber rujukan)



Sumber: Peneliti, 2020

CONCLUSION

This article examined competency-based curriculum reform and educational governance in Singapore and Canada between 2020 and 2026. The study directly answers the research objective by demonstrating that competency-based reform strengthens future skills development and educational resilience only when curriculum transformation is aligned with governance capacity, teacher professionalism, assessment redesign, and equity safeguards.

The findings reveal substantial institutional divergence between the two cases. Singapore demonstrates the advantages of centralized coordination, coherent implementation, and strong alignment between educational reform and national human capital strategy. Canada demonstrates the strengths of decentralized adaptation, learner-centered flexibility, and contextual curriculum interpretation. Both systems illustrate important strengths and risks. Singapore's model risks excessive standardization and implementation pressure, while Canada's model risks uneven institutional capacity and policy fragmentation.

The theoretical contribution is the Competency-Based Educational Governance Framework, which explains how governance structures, curriculum transformation, teacher capacity, and assessment legitimacy interact to shape learner outcomes and social development. The empirical contribution lies in demonstrating that competency-based education is not merely a curriculum innovation but a broader institutional transformation affecting governance, pedagogy, equity, and workforce development.

The educational policy implications are substantial. Governments should align curriculum reform with sustained teacher professional development, inclusive assessment systems, digital learning support, and equity-oriented funding mechanisms. Policymakers should avoid reducing competencies to labor-market metrics alone and instead integrate ethical reasoning, citizenship, well-being, and collaborative capability into educational design.

The study is limited by uneven comparability across Canadian provinces and by the evolving nature of competency assessment systems. Future research should examine classroom-level implementation, learner perceptions, AI-supported competency tracking, and competency-based reform in lower-income educational contexts.

Ultimately, competency-based educational transformation will contribute to sustainable social development only if educational systems balance innovation with inclusion, flexibility with legitimacy, and future skills with democratic educational values.

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