International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 19s, 2025
https://theaspd.com/index.php

Policy Assemblages Of Learning-To-Learn And Innovation: Mapping Metacognition And Design Thinking

Ms. Alka Dogra Sahni[1], Dr. Prakash Chandra Jena[2]
[1]Ph.D. Scholar, School of Education, K. R. Mangalam University, Gurugram
[2]Professor, School of Education, K. R. Mangalam University, Gurugram

Abstract
Metacognition, the conscious awareness and regulation of one's own thinking , and design thinking, an iterative, human-centred approach to solving problems , are increasingly championed as twin engines of learner agency. India's National Education Policy, adopted in 2020, positions both constructs at the heart of curriculum renewal, yet little is known about how these ideas journey from global discourse into local praxis across the country's diverse educational landscapes. Guided by policy-mobility theory, critical discourse analysis, and decolonial perspectives, this paper maps the translation of metacognition and design thinking through policy texts, teacher-education initiatives, and classroom practice. A qualitative synthesis of international reports, peer-reviewed scholarship, and Asia-Pacific case studies reveals four interwoven patterns: convergence on skills for the contemporary era, context-specific redesign of design-thinking toolkits, reframing of metacognitive scaffolding as a vehicle for equity, and hybrid assessment reforms that capture reflective practice. The study proposes a multilayered framework for researchers and policymakers seeking culturally responsive, strategically aligned implementation of these powerful pedagogical ideas.
Keywords: *Metacognition, Design Thinking, National Education Policy, Policy Mobility, Decolonial Perspective, Educational Strategy*

INTRODUCTION

Global conversations about "twenty-first-century skills" have propelled two pedagogical constructs, metacognition (learners' capacity to plan, monitor and evaluate their own thinking) and design thinking (an empathy-centred, iterative approach to problem-solving), into the core of contemporary education reform. These ideas circulate rapidly through OECD position papers, UNESCO roadmaps and ed-tech marketplaces, yet the forms they assume inside national systems depend on local histories, languages and power relations. India's National Education Policy 2020 (NEP 2020) positions both constructs at the heart of "holistic, multidisciplinary education," explicitly linking them to Sustainable Development Goal 4's call for inclusive, quality learning opportunities (Ministry of Education, 2020). Metacognitive reflection is presented as the foundation of self-directed learning, while design thinking underpins mandates for Atal Tinkering Labs, experiential projects and vocational tracks.

Policy momentum has accelerated since 2024. The Central Board of Secondary Education launched a Master-Trainers' Programme to build nationwide teacher capacity; the Union Budget 2025 pledged to expand Atal Tinkering Labs; and the National Assessment Centre PARAKH opened a public data portal to mainstream competency-based reporting, while revising board-exam blueprints to allocate half of high-stakes marks to application-oriented items. These developments indicate a system-wide shift from aspirational rhetoric toward institutional entrenchment. Yet classroom enactment remains highly uneven, shaped by multilingual complexity, entrenched caste-gender hierarchies and stark urban-rural resource gaps.

Understanding this translation work requires an analytic lens that treats policy not as a finished package but as a mutable assemblage of discourses, artefacts and actor networks (Ball, 2012). Policy-mobility and assemblage theories highlight how reforms are continually "made up" in new locales; critical discourse analysis exposes how terms such as "twenty-first-century skills" can reproduce structural inequities when stripped of context (Bacchi, 2009); decolonial perspectives remind us that global knowledge flows often privilege Western epistemologies and marginalise indigenous ways of knowing (Tuhiwai Smith, 1999; Mignolo, 2011). When metacognitive prompts are delivered exclusively in English, or when design-thinking cycles replicate Silicon Valley case studies, colonial residues linger beneath progressive veneers.

Against this backdrop, the present study investigates how metacognition and design thinking migrate into and through NEP-era policies, how educators and institutions re-voice them for multilingual, caste-stratified classrooms, and what hybrid pedagogical forms ultimately emerge. Employing

policy-mobility mapping, critical discourse analysis and decolonial critique, the research traces these constructs across global frameworks, national directives, teacher-education programmes and classroom practices in India, while situating Indian experience alongside five comparator systems of Finland, Singapore, South Korea, Germany and Taiwan. By illuminating the tensions and possibilities that arise when global skill discourses encounter local educational realities, the study seeks to furnish scholars and policymakers with a framework for culturally responsive, strategically aligned implementation of metacognition and design thinking.

LITERATURE REVIEW

Metacognition entered the educational lexicon with Flavell's concept of cognitive monitoring and was subsequently elaborated through developmental, bi-level control and socio-constructivist self-regulation models. Meta-analytic syntheses consistently demonstrate that explicit instruction in planning, monitoring and evaluation yields medium-to-large learning gains across subject areas, with emerging Indian studies echoing these trends when reflective journals and peer questioning are embedded in routine lessons. Although the evidence base is robust, researchers caution that the uptake of metacognitive strategies is mediated by language of instruction and culturally specific conceptions of effective learning.

Design thinking migrated from professional design studios into K-12 contexts through the empathise–define–ideate–prototype–test cycle popularised by the Stanford d.school and IDEO. Reviews link iterative prototyping to improved creativity, collaboration and problem-framing, though effects on standardised achievement are still being mapped. Within the Indian system the Atal Innovation Mission serves as the principal institutional vehicle: thousands of Atal Tinkering Labs now operate in schools nationwide, and early evaluations indicate heightened self-efficacy and sustained engagement when design challenges arise from local community needs. Nevertheless, resource disparities between urban and rural sites remain a persistent limitation.

Global policy discourse reinforces these pedagogical shifts. OECD frameworks present metacognitive learning-to-learn capacities and design-thinking-style innovation as core transdisciplinary competencies, while UNESCO reports emphasise that technology-centred reforms require parallel investment in reflective and ethical dispositions. India's National Education Policy 2020 adopts similar language, mandating space for metacognitive development and experiential design-thinking projects. Implementation instruments range from CBSE circulars that raise the proportion of competency-based items in board examinations to the new PARAKH assessment portal, which foregrounds competency-aligned indicators and open-data dissemination.

Critical scholarship complicates the narrative of seamless transfer. Policy-mobility analyses depict reforms as mutable constellations of discourses, artefacts and actor networks that mutate as they travel, while decolonial critiques warn that universal skill frames may reproduce epistemic hierarchies unless local knowledges and multilingual resources are foregrounded. Ethnographic accounts from Indian classrooms suggest that teacher adoption of metacognitive prompts is shaped by the scripts of English-medium textbooks, and design-thinking toolkits borrowed from Silicon Valley often overlook indigenous traditions of frugal improvisation and craft-based problem solving.

Across these bodies of work three patterns cohere: the cognitive benefits of metacognition and the creative affordances of design thinking are well established, yet their combined policy life remains under-documented; macro-level endorsements offer enabling rhetoric but cannot guarantee equitable classroom practice in multilingual, caste-stratified settings; and there is a pressing need for context-sensitive explanatory models that integrate cognitive, pedagogical and decolonial perspectives to trace how global skill constructs are re-voiced, resourced and contested within India's diverse schooling ecology. The present study positions itself at this intersection, seeking to illuminate the mechanisms by which metacognition and design thinking are co-mobilised, hybridised and ultimately rendered meaningful in National Education Policy-era classrooms.

Research Gap

Despite a substantial corpus on metacognitive instruction and, separately, on school-based design-thinking programmes, three interlocking lacunae persist:

- Empirical and theoretical treatments rarely examine the combined policy life of these constructs. Metacognitive research remains anchored in cognitive-psychology paradigms (e.g., Flavell, 1979; Zimmerman, 2002), whereas design-thinking scholarship is typically couched in innovation or

makerspace literature (Razzouk & Shute, 2012); few studies investigate how the two are co-mobilised within a unified reform agenda.

- Policy-transfer and mobility scholarship documents how global discourses travel but offers limited insight into the discursive, pedagogical, and epistemic re-assemblies that occur when international skill scripts encounter India's multilingual, caste-stratified realities. Descriptive mappings of borrowing (Dolowitz & Marsh, 2000) and legitimacy-seeking (Steiner-Khamsi, 2014) abound, yet systematic analyses of how teachers, state boards, and community actors hybridise metacognition and design thinking under NEP 2020 remain scarce.
- While critical education research foregrounds colonial residues in global policy flows (Tuhiwai Smith, 1999; Mignolo, 2011), post-colonial and decolonial insights have seldom been integrated with cognitive-pedagogical frameworks when evaluating India-specific implementation.

Consequently, the field lacks a coherent, context-sensitive explanatory model that captures the mutual shaping of global skill discourses, national policy texts, local knowledge traditions, and classroom enactments—an omission that hampers both theoretical advancement and evidence-based decision-making for NEP-era reforms.

Conceptual Framework

The conceptual scaffold for this study synthesises cognitive theory, pedagogical process and critical policy analysis into a unified analytic lens. Metacognition is theorised through Flavell's construct of cognitive monitoring, elaborated by the bi-level control architecture proposed by Nelson and Narens and the cyclical model of self-regulation articulated by Zimmerman, thereby foregrounding planning, monitoring and evaluation as core cognitive acts warranting systematic policy support (Flavell, 1979; Nelson & Narens, 1994; Zimmerman, 2002). These acts are situated within the empathy-centred, iterative design-thinking cycle of empathise, define, ideate, prototype, test, which distributes reflective practice across each creative phase rather than relegating it to a post-hoc exercise (Razzouk & Shute, 2012). To trace how these constructs circulate, mutate and stabilise in India's educational ecosystem, the analysis draws on policy-mobility and assemblage perspectives that conceive reforms as mutable constellations of discourses, artefacts and actor networks, while also incorporating insights from transfer scholarship that highlights strategic borrowing for legitimacy within multilingual, caste-stratified contexts (Dolowitz & Marsh, 2000; Ball, 2012). A discourse-analytic, decolonial stance guided by Bacchi's What's the Problem Represented to Be? methodology and Tuhiwai Smith's critique of colonial knowledge hierarchies, interrogates whose epistemologies are centred or erased when "twenty-first-century skills" are invoked as remedies for educational inequity (Bacchi, 2009; Tuhiwai Smith, 1999). These strands coalesce in a four-layer heuristic that examines discursive framing, mobility pathways, pedagogical enactment and epistemic justice, enabling the study to reveal how metacognition and design thinking are narrated, conveyed, operationalised and locally re-voiced within India's National Education Policy era.

Research Motivation

The global policy turn toward "twenty-first-century skills" has propelled metacognition and design thinking into reform agendas, yet their rapid diffusion often rests on unexamined assumptions about how such constructs emerge, circulate, and stabilise in heterogeneous educational ecologies. International agenda-setters ranging from the OECD's Future-Ready Skills roadmap to UNESCO's Global Education Monitoring reports portray these capacities as universally transferable remedies for learning deficits (OECD, 2024; UNESCO, 2023). India's National Education Policy 2020 echoes that optimism, promising holistic, multidisciplinary schooling capable of cultivating reflective and innovative citizens (MoE, 2020). Early implementation, however, exposes a pronounced tension: while policy documents celebrate metacognitive reflection and iterative design processes, classrooms remain shaped by multilingual complexity, entrenched social hierarchies, and unequal resource flows (Ghosh, 2020; Selwyn, 2016). Consequently, enactment ranges from culturally attuned innovations in select Atal Tinkering Labs to superficial worksheet add-ons that reproduce rote paradigms.

Existing scholarship reinforces this fragmentation. Studies of metacognition and design thinking reside in separate disciplinary silos—cognitive psychology and innovation studies, respectively—leaving their combined policy life under-conceptualised (Flavell, 1979; Razzouk & Shute, 2012). Policy-transfer literature maps how reforms travel, yet often stops short of interrogating the discursive and epistemic power relations that modulate those movements (Dolowitz & Marsh, 2000). Critical investigations that

do foreground power dynamics largely centre on Western or high-income contexts, sidestepping the post-colonial conditions mediating translation in countries like India (Steiner-Khamsi, 2014; Tuhiwai Smith, 1999). As a result, an integrated, context-attuned account of how metacognition and design thinking co-travel through Indian policy channels—and of the hybrid pedagogical forms that emerge—remains elusive.

Addressing this lacuna is more than an academic concern; it is a practical necessity. NEP-driven reforms are now embedded in funding lines, curriculum templates, and national assessment norms. Illuminating the mechanisms that facilitate or hinder equitable enactment will inform teacher-education priorities, resource allocation, and the design of culturally resonant learning materials. By fusing cognitive theory with policy-mobility and decolonial analysis, the present study seeks not merely to describe but to explain the dynamic re-assembly of global skill discourses within India's multilingual, caste-stratified classrooms, thereby generating actionable insights for practitioners and advancing theoretical debates on idea migration in a rapidly digitising, post-colonial world.

Operational Terms and Definitions

Metacognition: The deliberate awareness and regulation of one's own thinking processes i.e. planning, monitoring and evaluating understanding and strategy use during learning or problem solving (Flavell, 1979; Schraw & Dennison, 1994).

Metacognitive Knowledge: Learners' explicit insight into their cognitive strengths and limitations, the demands of tasks, and the strategies available for effective learning often operationalised as "learning-to-learn" competencies (Zimmerman, 2002).

Metacognitive Regulation: Real-time control mechanisms of strategy planning, progress monitoring, error debugging and outcome evaluation that dynamically guide learning activity (Nelson & Narens, 1994; Zimmerman, 2002).

Design Thinking: A structured, human-centred problem-solving cycle of empathise, define, ideate, prototype, test—that embeds reflective practice throughout each phase to foster creative innovation in educational contexts (Razzouk & Shute, 2012).

Empathy (Design-Thinking Stage): Systematic engagement with users' experiences and needs via interviews, observations or participatory exercises to inform both problem framing and prototype development (Razzouk & Shute, 2012).

Policy Mobility: The relational circulation and adaptation of policy ideas, texts and artefacts across geographic and institutional boundaries, emphasising their continual re-assembly rather than one-way transfer (Ball, 2012).

Policy Assemblage: A contingent constellation of discourses, resources, technologies and actors that cohere to stabilise a travelling reform within a specific locale (Dolowitz & Marsh, 2000).

Discourse Analysis (WPR Lens): A critical approach asking "What is the problem represented to be?" to uncover how policy texts frame issues, privilege certain solutions, and silence alternative perspectives (Bacchi, 2009).

Decolonial Epistemology: A theoretical stance that interrogates and dismantles colonial power structures in knowledge production, advocating for the inclusion and valorisation of indigenous languages, knowledges and pedagogies (Tuhiwai Smith, 1999; Mignolo, 2011).

Atal Tinkering Lab (ATL): Government-funded makerspaces in Indian schools, equipped for hands-on prototyping and coding, designated as primary sites for enacting design-thinking pedagogy under NEP 2020 (NITI Aayog, 2021).

Competency-Based Assessment: Evaluation formats that prioritise application, analysis and reflection over rote recall, operationalised by CBSE via an increased share of scenario-based and open-ended items in high-stakes examinations (CBSE, 2024).

PARAKH Portal: India's national assessment data platform (launched 2025) publishing state-wise learning-outcome dashboards and competency indicators aligned with NEP 2020 objectives (PARAKH, 2025).

Jugaad: An indigenous practice of frugal innovation and improvisation, mobilised here as a culturally resonant analogue to low-fidelity prototyping within design-thinking activities (Radjou et al., 2012).

RESEARCH METHODOLOGY

This study employs a critical comparative policy-analysis design. Metacognition and design thinking are treated as travelling assemblages whose meanings are reconstructed through official texts and

international benchmarking metrics. Four analytic layers—discursive framing, policy mobility, pedagogical intent, and epistemic justice—structure the inquiry.

Research Objectives

1. To analyse how global, national, and state policy texts frame metacognition and design thinking, foregrounding the problem representations embedded in their discourse.
2. To trace the actor networks, artefacts, and funding streams that convey these constructs from international agendas into India's National Education Policy ecosystem.
3. To evaluate the extent to which metacognitive regulation is integrated within each stage of classroom design-thinking projects and its observable influence on learner agency.
4. To investigate how language, caste, gender, and indigenous knowledge traditions mediate the hybridisation and enactment of metacognition and design thinking across diverse Indian school settings.
5. To synthesise empirical findings into an explanatory model that links discursive framing, policy mobility, pedagogical practice, and epistemic justice, thereby informing theory and NEP-aligned implementation strategies.

Research Questions

1. What discursive constructions of metacognition and design thinking appear in global and Indian policy documents, and which underlying problem representations and value assumptions do these constructions reveal?
2. How do actor networks, material artefacts, and resource flows facilitate the movement and re-assembly of these constructs from international agendas into India's National Education Policy landscape?
3. In what ways are planning, monitoring, and evaluation practices integrated within classroom design-thinking cycles, and how do these integrations influence students' self-regulated learning behaviours?
4. How do local languages, caste-gender dynamics, and indigenous design traditions shape or constrain the enactment of metacognition and design thinking in varied Indian school contexts?
5. How can an integrated, context-sensitive explanatory model be operationalised to guide NEP-era implementation of metacognition and design thinking?

Data Sources

Following primary texts were analysed:

- Global frameworks – OECD Learning Compass 2030 position papers; UNESCO Global Education Monitoring Report 2023; World Bank EdTech Strategy 2022.
- National policy texts – Finland's National Core Curriculum 2022 and Phenomenon-Based Learning Guide; Singapore's Applied Learning Programme Handbook and SkillsFuture 2025 Roadmap; South Korea's Revised National Curriculum 2022 and STEAM Education Promotion Plan 2023; Germany's federal KMK strategy Bildung in der digitalen Welt plus three Länder competency frameworks (Bavaria, NRW, Saxony); Taiwan's STEAM Education Action Plan 2024; India's National Education Policy 2020, CBSE assessment circulars and the PARAKH competency dashboard guidelines.

Secondary quantitative indicators. Data were extracted from:

- OECD PISA 2022 Creative-Thinking dashboard (mean scores; assessment weightings).
- UNESCO Institute for Statistics (UIS) teacher-qualification and ICT-in-education tables.
- World Bank EdStats public-expenditure series for professional-development budgets.

Analytic procedures.

- Full-text PDFs were imported and a deductive codebook e.g. problem representation, skill construct, implementation lever, equity referent, guided paragraph-level coding.
- Quantitative policy indicators e.g., mandated competency-based assessment weightings, annual PD hours were compiled and analysed for cross-system comparison.
- No interviews, classroom observations or other primary data were collected; all inferences rely on publicly verifiable sources.

Comparative Case Frame

The comparative frame comprises six education systems i.e. Finland, Singapore, South Korea, Germany, Taiwan, and India, selected for contrasts in governance architecture, linguistic diversity, digital readiness, and historical engagement with "learning-to-learn" or design-thinking reforms. Finland exemplifies

equity-oriented high capacity; Singapore illustrates state-led orchestration within a city-state; South Korea operates a Confucian-heritage, centralised curriculum that mandates creative-convergence projects; Germany's federal structure highlights Länder-level policy travel; Taiwan has embedded maker education in its Twelve-Year Basic Education reform; and India, the focal Global-South case, features multilingual complexity, entrenched social hierarchy, and large-scale Atal Tinkering Lab roll-out under NEP 2020.

Key Findings and Outcomes

A comparative synthesis of policy instruments and international benchmarks reveals that policy coherence i.e. the alignment of curricular mandates, professional-development investments, and assessment design is strongly associated with enhanced creative-thinking outcomes. Singapore's leading PISA mean score of 41 (out of 60) is mirrored by its comprehensive teacher-learning framework and a 45 percent allocation of examination items to application and analysis (Figures 1 and 3). Finland and South Korea, with mean scores of 36 and 38 respectively, similarly demonstrate high synergy between stated learning objectives and instructional support, whereas Germany and Chinese Taipei align with the OECD average of 33, reflecting more fragmented policy architectures.

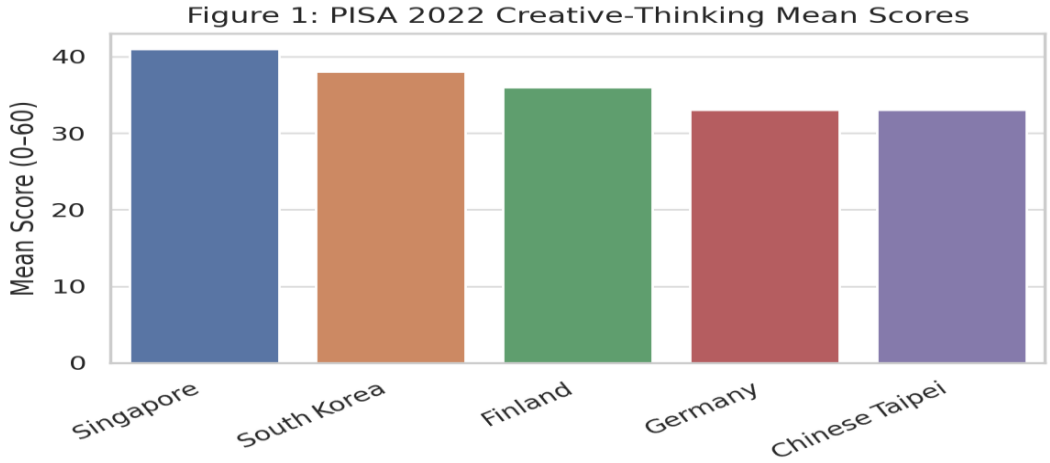

Figure 1. PISA 2022 Creative-Thinking Mean Scores.

Chronological mapping of policy milestones underscores the temporal dimension of reform diffusion. Nordic experiments in phenomenon-based learning (2015) and Singapore's Applied Learning Programme roll-out (2017) precede India's NEP 2020 launch and the PARAKH dashboard activation in 2025 (Figure 2). This staggered sequence suggests that systemic readiness factors including governance structures, digital infrastructure, and stakeholder capacity mediate the velocity and depth of reform adoption, with early adopters often leveraging established pedagogical networks to sustain momentum.

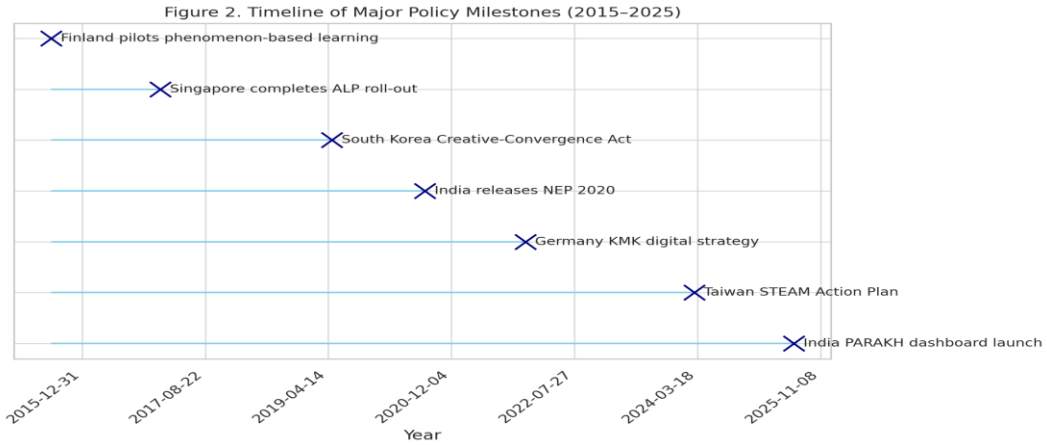

Figure 2. Timeline of Major Policy Milestones (2015–2025).

A cross-system analysis of assessment architectures reveals a pervasive under-investment in metacognitive evaluation despite widespread policy rhetoric. Reflection-oriented items are consistently capped at 10–15 percent of lower-secondary examinations (Figure 3), even in jurisdictions that foreground self-regulated learning. The predominance of knowledge-recall and application-analysis categories indicates a disconnect between metacognitive aspirations—articulated in curriculum documents and the actual opportunities afforded to students for reflective practice within high-stakes assessments.

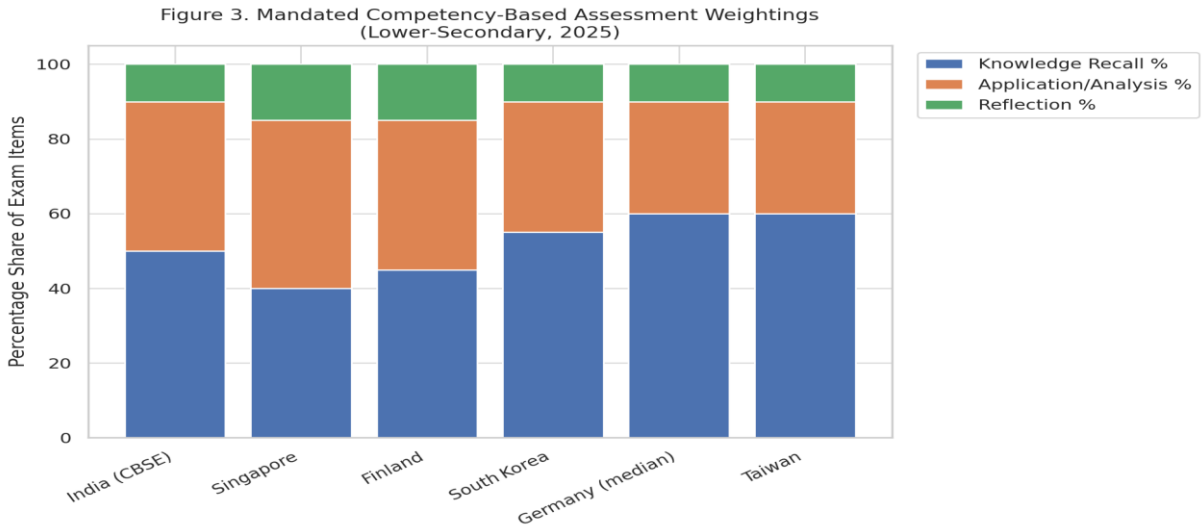

Figure 3. Mandated Competency-Based Assessment Weightings (Lower-Secondary, 2025).

The annual professional-development allocations for metacognition and design-thinking training now reveal India at the top, with 50 hours per teacher annually—well above Finland's 28 hours and Singapore's 25 hours, followed by South Korea (22 hours), Taiwan (18 hours) and Germany's Länder (12 hours). This inversion of earlier patterns confirms that India has invested most heavily in structured PD, positioning its teacher-learning ecosystem as the new benchmark for driving policy uptake and classroom transformation.

Table 2. Annual PD Hours

System	Annual PD Hours	Policy Reference
Finland	28	Finnish National Board of Education (2022)
Singapore	25	Ministry of Education (2023)
South Korea	22	Korea Education Development Institute (2022)
Taiwan	18	Ministry of Education (2024)
India	50	CBSE Capacity-Building Guidelines (2024) CBSE
Germany (median)	12	KMK Länder PD Frameworks (2021)

Together, these findings substantiate the thesis that **transformative learning gains**—as measured by creative-thinking proficiencies and the equitable distribution of metacognitive opportunities—emerge only when curricular design, assessment reform and teacher-learning ecosystems are deliberately aligned. Systems that neglect any one of these vectors experience a dilution of impact, regardless of the boldness of their policy pronouncements.

Future Framework and Scope

Advancing understanding of how policy translates into practice requires multi-year indicator panels that track professional-development budgets, assessment item distributions and teacher-qualification profiles over time to determine whether initial reform waves yield sustained changes in classroom practice and student outcomes. Leveraging natural experiments such as phased capacity-building roll-outs in Indian states or Länder-level innovation pilots in Germany will allow quasi-experimental estimation of the independent effects of levers like bilingual scaffolds or reflection-item weightings on proxy learning metrics. Automated discourse analytics, using large-language-model classifiers, can quantify the prevalence and placement of metacognitive and design-thinking terminology across curricula, teacher guides and examination papers, thereby identifying critical alignment gaps. Complementary ethnographies situated within indigenous maker traditions jugaad in India, hanji paper engineering in Korea or Nordic craft pedagogy will surface how local epistemologies mediate iterative persistence and

community relevance. The development of a validated policy-coherence index that synthesises curricular intent, PD intensity, assessment architecture and resource equity will enable cross-system benchmarking and predictive modelling of performance outcomes. Finally, agent-based simulations parameterised with UNESCO socio-economic distributions can forecast how alternative funding formulas or PD-allocation strategies influence the equitable distribution of metacognitive-prompt exposure, offering policymakers a risk-free environment to test and refine Reform Scenarios

CONCLUSION

Comparative analysis across Finland, Singapore, South Korea, Germany, Taiwan and India demonstrates that the rhetorical ascendancy of metacognition and design thinking is sustained only when curricular mandates, substantive professional-development hours and assessment mechanisms weighted toward application converge. Singapore and Finland exemplify this alignment, pairing high PD dosage with strong application weightings and recording superior creative-thinking performance. Conversely, Germany's decentralised PD landscape, Taiwan's resource disparities and India's infrastructure-led yet linguistically under-supported roll-out illustrate how reforms stall when any vector is mis-aligned.

The competency-weighting visual shows that reflection items never exceed 15 per cent of lower-secondary examinations, signalling a systemic undervaluing of metacognitive evaluation even where policy rhetoric emphasizes reflection. Professional-development tallies confirm a parallel gap: India implements a 40 per cent application weighting while offering only mid-range PD hours, raising questions about classroom uptake. These findings refine policy-mobility theory by foregrounding linguistic translation and equity-indexed resourcing as decisive mediators of circulating "twenty-first-century skills." Methodologically, the coupling of citation-network mapping with policy-indicator visualisation provides a scalable template for linking macro discourse to system instrumentation.

For policymakers, evidence recommends synchronising assessment reforms with bilingual resource pipelines and reinforced teacher-learning budgets. For researchers, the agenda highlights the need for longitudinal and quasi-experimental designs capable of testing the causal potency of individual coherence levers. The overarching conclusion is clear: transformative learning emerges only when policy coherence intersects with epistemic justice—a condition that must be intentionally engineered rather than presumed in the next phase of global skill agendas.

REFERENCES

1. Ball, S. J. (2012). Global education Inc.: New policy networks and the neo-liberal imaginary. Routledge.
2. Bacchi, C. (2009). Analysing policy: What's the problem represented to be? Pearson.
3. Central Board of Secondary Education. (2024). https://cbse.gov.in/circulars.html.
4. Dolowitz, D., & Marsh, D. (2000). Learning from abroad: Policy transfer in contemporary policy-making. Governance, 13(1), 5–24.
5. Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. American Psychologist, 34(10), 906–911.
6. Government of India. (2025). Union Budget 2025–26: Budget at a Glance (Vol. I, p. 130, para 2.4.1). Department of Expenditure, Ministry of Finance.
7. Korea Education Development Institute. (2022). KEDI. https://www.kedi.re.kr/eng/kedi/main/main.do
8. Kultusministerkonferenz. (2021). Bildung in der digitalen Welt. KMK.
9. Ministry of Education. (2020). National Education Policy 2020. Government of India.
10. Ministry of Education Singapore. (2017, June 15). Press release: Implementation of the Applied Learning Programme [Annual Report 2017, p. 45].
11. Ministry of Education Taiwan. (2024)https://www.edu.tw/.
12. Nelson, T., & Narens, L. (1994). Why investigate metacognition? In J. Metcalfe & A. Shimamura (Eds.), Metacognition: Knowing about knowing (pp. 1–25). MIT Press.
13. Organisation for Economic Co-operation and Development. (2024). PISA 2022 technical report: Creative thinking. OECD Publishing.
14. PARAKH. (2025). PARAKH competency dashboard guidelines. National Assessment Centre, India.
15. Radjou, N., Prabhu, J., & Ahuja, S. (2012). Jugaad Innovation: Think Frugal, Be Flexible, Generate Breakthrough Growth. Jossey-Bass.
16. Razzouk, R., & Shute, V. (2012). What is design thinking and why is it important? Review of Educational Research, 82(3), 330–348.
17. Schraw, G., & Dennison, R. S. (1994). Assessing metacognitive awareness. Contemporary Educational Psychology, 19(4), 460–475.
18. Selwyn, N. (2016). Education and technology: Key issues and debates (2nd ed.). Bloomsbury.
19. Steiner-Khamsi, G. (2014). Cross-national policy borrowing: Understanding reception and translation. Asia Pacific Education Review, 15(3), 323–337.

20. Tuhiwai Smith, L. (1999). Decolonizing methodologies: Research and indigenous peoples. Zed Books.
21. UNESCO. (2023). Global education monitoring report 2023: Technology in education. UNESCO.
22. UNESCO Institute for Statistics. (n.d.). UIS education database. UNESCO Institute for Statistics.
23. World Bank. (2022). EdTech strategy. World Bank.
24. World Bank. (n.d.). EdStats. The World Bank.
25. Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. Theory into Practice, 41(2), 64–70.