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Implementing Modular and Competency-Based Assessment in India's National Boards

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Abstract

The Indian education system, traditionally centered on high-stakes board examinations, is undergoing scrutiny for its overreliance on rote memorization and limited alignment with 21st-century skills. Drawing on global best practices from countries like Finland, Singapore, and the UK, the study presents a conceptual framework integrating modular assessment—which divides the syllabus into thematic units with periodic evaluations—and competency-based education, focusing on mastery of cognitive and non-cognitive skills. This study critically examines the potential transition from India's traditional high-stakes board examinations to modular and competency-based assessment systems, aligned with the National Education Policy (NEP) 2020. It highlights limitations of the current exam model, including rote learning, stress, inequity, and narrow evaluation methods. The research underscores the pedagogical, structural, and policy shifts required for this transformation, emphasizing teacher training, curriculum redesign, assessment literacy, and digital infrastructure. Implementation strategies include pilot programs, phased rollout, and leveraging the national assessment regulator PARAKH. The study concludes that adopting modular and competency-based assessments can reduce exam pressure, foster equity, and prepare students for life-long learning, marking a fundamental re-orientation of India's education system toward flexibility, inclusivity, and 21st-century competencies.

1. INTRODUCTION

The Indian education system, one of the largest globally, has traditionally relied on high-stakes board examinations at the secondary (Class 10) and senior secondary (Class 12) levels, conducted by boards such as CBSE, ICSE, and state education boards (Singh, Meenakshi & Ahmad, 2025; Azim Premji Foundation, 2023). These exams heavily influence access to higher education and employment but have been criticized for promoting rote learning, anxiety, and neglecting holistic development (Mehta & Kumar, 2022). Globally, reforms prioritize mastery over memorization and multiple pathways for demonstrating learning

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(Darling-Hammond, 2014). This study critically explores replacing India's traditional board exams with modular and competency-based assessments, drawing on policy frameworks and international experiences. It highlights the structural reforms, pedagogical shifts, and capacity-building needed for this transformation. Ultimately, the reform signifies a fundamental shift from a narrow focus on scores to a broader vision of lifelong learning, equity, and empowerment.

1.1 Re-thinking Assessment in the Post-Pandemic Era

The COVID-19 pandemic was a major catalyst for reimagining education worldwide, including in India. With schooling dependent on rigid academic calendars and centralized board exams, the sudden shift to online learning exposed significant disparities in digital access, teacher readiness, and student engagement (Jandhyala, 2021). The disruption highlighted inequalities but also opened opportunities for flexible, modular curriculum delivery and assessment (UNESCO, 2021). During lockdowns, boards like CBSE and ICSE cancelled or redesigned high-stakes exams, relying on internal assessments and hybrid evaluation models based on past performance and school data (NUEPA, 2021; Sharma & Verma, 2022). This shift led educators and policymakers to question whether annual board exams should remain the primary evaluation method (Sharma & Verma, 2022). Experts argue the pandemic acted as a "stress test," revealing limitations of summative evaluations and emphasizing the need for continuous, diversified approaches to assessing student learning (Anderson & Horn, 2021; Reimers & Schleicher, 2020).

1.2 Moving Toward Modular and Competency-Based Assessment

India's National Education Policy (NEP) 2020 proposes a transformative reform of school education by re-designing board exams to focus on students' understanding and application of core concepts, moving away from rote memorization. It advocates a modular system where students can take exams in different subjects at various times during the year (Ministry of Education, 2020). This aligns with global best practices seen in countries like Finland, Australia, and Singapore, which use flexible, skill-based assessments to promote continuous learning and equity (Sahlberg, 2021). Modular and competency-based assessments evaluate specific learning outcomes essential for academic and professional success, including cognitive skills such as analysis and synthesis, as well as non-cognitive skills like collaboration, ethical reasoning, and resilience (OECD, 2022). The academic year is divided into modules, each assessed separately, enabling timely feedback and personalized learning

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(Patrick, 2023). This student-centred approach moves away from high-stakes exams, fostering deeper understanding and lifelong learning, and promises a more equitable, future-ready education system in India.

2. LIMITATIONS OF INDIA'S CURRENT BOARD EXAM SYSTEM

India's existing board examination system faces several challenges:

2.1 Rote Learning: Prioritization of Memorization Over Understanding

A major criticism of India's board exams is their heavy reliance on rote learning—memorizing facts without meaningful understanding or application. Exam papers typically reward correct answers to predictable textbook-based questions, discouraging critical thinking and creativity. This focus on reproducing textbook material leads students to rely on "important questions" and coaching notes rather than deeply engaging with content. As noted by the National Curriculum Framework (NCERT, 2023), this approach limits the development of higher-order skills needed for real-world problem-solving and lifelong learning.

2.2 Single-Point, High-Stakes Assessment

The current board examination system relies on high-stakes testing, where student success depends mainly on one or two final exams. This model ignores individual learning paces and assumes all students are equally ready on exam day. It leaves little room for illness, anxiety, or personal issues that can impact performance, with serious consequences for future opportunities. Additionally, minimal formative assessment means students miss out on ongoing feedback and support, leading to last-minute cramming and a compressed learning experience.

2.3 Stress, Pressure, and Inequity

The high-stakes board exams cause significant stress and anxiety among students, often leading to depression and burnout, especially during exam season (Kaur & Arora, 2017). This pressure is heightened by societal expectations and competition. The system also worsens social inequalities, as privileged students have access to better resources while those in rural or under-resourced areas face greater challenges. Additionally, research shows a gendered

impact, with girls in conservative communities sometimes denied education if they perform poorly, highlighting systemic exclusions and lack of fairness.

2.4. Teacher-Centered Instruction and Limited Student Agency

The exam system reinforces teacher-centered, exam-driven instruction, focusing on syllabus coverage rather than deeper understanding. This limits the use of inquiry-based or collaborative learning, as such approaches are not rewarded in exams. Consequently, student creativity and engagement suffer, with little opportunity for exploration or independent projects. Formative feedback is minimal, leaving students unaware of learning gaps. Additionally, teacher training rarely addresses alternative assessments or innovative pedagogy, which hinders meaningful reform.

3. MODULAR AND COMPETENCY-BASED EDUCATION: A CONCEPTUAL FRAMEWORK

The transition towards modular and competency-based education (CBE) fundamentally rethinks how learning is structured, delivered, and assessed. Traditional systems, including India's, have relied on linear, time-bound instruction ending in high-stakes summative exams. Emerging pedagogies emphasize mastery over memorization, flexibility over rigidity, and personalization over standardization. Modular assessment and CBE form the core of this transformation, offering promising frameworks for modernizing school assessments.

3.1 Modular Assessment

3.1.1 Concept and Pedagogical Advantages

Modular assessment breaks subjects into discrete units or modules, each independently assessed instead of a single year-end exam. This approach spreads evaluation over time, encouraging continuous learning and timely feedback, reducing exam stress, and allowing students to retake specific modules without repeating the whole year. It supports scaffolded learning and deeper conceptual understanding (Ofqual, 2018; Black & Wiliam, 2009; Harlen, 2007).

3.1.2 Global Implementations

The UK's A-Level system historically used modular designs with Advanced Subsidiary (AS) and A2 stages, enabling flexible pacing and personalized pathways.

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Though reforms shifted toward linear exams to curb grade inflation and excessive testing (DfE, 2014), the modular system showed clear benefits. Pearson Edexcel's International GCSE (IGCSE) and International Advanced Level (IAL) maintain modular structures, allowing students to sit for and re-sit modules independently (Pearson, 2023). In the U.S., credit-based high school and community college systems implement modularity through semester-long courses granting independent credits tailored to student goals (U.S. Department of Education, 2020).

3.1.3 Modular Assessment Framework for India

Modular assessment offers India a shift from high-stakes board exams to continuous, student-centred evaluation. The academic year can be divided into modules assessing specific competencies aligned with national standards. Periodic module assessments provide incremental learning, timely feedback, and foster deeper understanding. The NEP 2020 supports flexible, formative, competency-based testing (Ministry of Education, 2020). Modularity allows differentiated pacing and retakes of individual modules, reducing anxiety and dropout rates. It also enables interdisciplinary learning and real-world problem solving. Effective implementation requires robust assessment design, teacher training, digital tracking, and alignment with boards like CBSE, ICSE, and state boards.

3.2 Competency-Based Education

3.2.1 Definition and Pedagogical Foundations

Competency-Based Education moves the focus from traditional content coverage and classroom hours to students demonstrating clearly defined, measurable skills and outcomes. These competencies include cognitive abilities (e.g., analytical reasoning), technical skills (e.g., coding), and socio-emotional traits (e.g., collaboration, self-regulation) (Sturgis & Patrick, 2010). Progression depends on mastery, enabling personalized learning paces. Rooted in constructivist theory, CBE emphasizes active engagement, real-world application, and reflective thinking (Vygotsky, 1978). It aligns with global frameworks like OECD Learning Compass 2030, prioritizing adaptability, agency, and lifelong learning (OECD, 2022). CBE promotes equity and inclusivity, suiting diverse learners.

3.2.2 Global Models and Integration with Modular Approaches

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CBE is gaining traction globally. New Hampshire's Performance Assessment of Competency Education (PACE) integrates interdisciplinary tasks assessed via rubrics and teacher judgment, moving away from standardized tests (Levine & Patrick, 2019). Many U.S. districts combine CBE with modular credit systems, awarding credit based on mastery rather than fixed hours (Le, Wolfe, & Steinberg, 2014). Finland incorporates CBE in thematic modules across disciplines, supported by formative assessments like portfolios and projects (Sahlberg, 2021). Singapore's Applied Learning Programme emphasizes real-world skills and modular progression tailored to academic or vocational goals (OECD, 2022). These models illustrate how modularity and CBE synergize to enhance lifelong learning.

3.2.3 Relevance and Implementation in India

India faces challenges with its exam-driven schooling system. NEP 2020 advocates outcome-based education and flexible, understanding-focused assessments (Ministry of Education, 2020). Together with modular assessment, CBE decentralizes high-stakes exams into continuous, personalized evaluations, reducing pressure and improving equity by accommodating varied learning paces. The establishment of Performance Assessment, Review, and Analysis of Knowledge for Holistic Development (PARAKH), the national assessment regulator, under NEP 2020, is a significant step toward CBE infrastructure (NCERT, 2023). Successful adoption requires comprehensive teacher training, curriculum redesign, and development of rubrics and digital platforms for real-time competency tracking (UNICEF India, 2023). Adapting global best practices to local contexts can help India build a meaningful, inclusive, future-ready education system.

3.2.4 CBE Framework for Indian Curriculum

Implementing CBE means shifting from syllabus-driven teaching to learner-centric education based on clear learning outcomes. Boards like CBSE and ICSE must identify competencies covering foundational knowledge and higher-order skills, aligned vertically across grades and horizontally for interdisciplinary learning. Assessments must move beyond standardized tests to include performance tasks, portfolios, and teacher-led evaluations of real-world knowledge application. Digital tools and learner analytics are essential for tracking mastery, feedback, and remediation (UNICEF India, 2023). Teacher training should emphasize competency

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mapping, differentiated instruction, and rubric-based evaluation. NEP 2020 and initiatives like PARAKH provide strong policy support, but sustained capacity building and stakeholder engagement are vital for embedding CBE across India's diverse education landscape (Ministry of Education, 2020; NCERT, 2023).

For India, adopting these reforms can transform assessment, reducing exam stress, promoting equity, and preparing students to thrive in a complex, dynamic world.

4. TOWARD A NEW ASSESSMENT MODEL: POLICY AND PRACTICE

India's National Education Policy (NEP) 2020 advocates shifting from high-stakes summative exams to formative, diagnostic, and competency-based assessments. This learner-centered approach prioritizes conceptual understanding, creativity, and critical thinking over rote memorization (Ministry of Education, 2020). Modular and competency-based assessments align closely with this vision by breaking subjects into thematic units assessed independently, enabling continuous, inclusive, and competency-oriented evaluation.

4.1 Modular and Competency-Based Assessment Structure

Under this system, subjects like science or mathematics are divided into 3–4 modules annually, each covering specific topics and learning outcomes. Assessments combine school-based evaluations by trained teachers with board-moderated exams to ensure fairness and maintain standards. Diverse assessment methods such as projects, portfolios, oral tests, and performance tasks supplement traditional exams, making evaluations more holistic and reflective of real competencies.

4.2 Competency Rubrics and Standardization

Competency rubrics are critical, providing clear, detailed criteria for proficiency levels in various skills and knowledge areas. Developed collaboratively by boards, curriculum experts, and teachers, these rubrics ensure transparent, objective evaluation and help identify student learning gaps. Moderation practices like teacher training, external audits, and calibration workshops maintain reliability across India's diverse educational contexts.

4.3 Pedagogical Implications

4.3.1 Teacher Training

Successful adoption depends on comprehensive teacher professional development. Educators require training in performance-based assessments, rubric use,

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differentiated instruction, and formative feedback. Programs must include competency mapping, inquiry-based learning, and digital tools to empower teachers as facilitators of personalized learning (Sharma, 2020).

4.3.2 Curriculum Redesign

The curriculum should change its focus from content overload to depth and competency development. Inter-disciplinary themes and project-based learning promote real-world relevance and critical thinking. For example, an environmental science module might integrate geography, biology, and civic education to foster holistic understanding.

4.3.3 Assessment Literacy

Building assessment literacy among students, teachers, parents, and school leaders is essential. Orientation materials and workshops can help stakeholders understand varied assessment formats like portfolios and peer evaluations, encouraging students' ownership of their own learning.

4.4 Implementation Strategy

Phase 1: Pilot Programs

Begin with pilot projects in diverse schools to test modular and competency-based models in selected subjects, gathering data and feedback from all stakeholders.

Phase 2: Capacity Building

Scale up through teacher workshops, digital infrastructure development, and establishing collaborative learning communities for ongoing support.

Phase 3: Policy Alignment

Leverage PARAKH, India's national assessment body, to develop guidelines, validate rubrics, coordinate moderation, and work with state boards to tailor assessments regionally.

Phase 4: Full Rollout

Implement gradually over 5–7 years, allowing time to address infrastructure, teacher shortages, and capacity issues. Continuous research and evaluation will guide policy refinement.

4.5 Challenges and Mitigation

- Resistance from stakeholders: Conduct awareness campaigns, workshops, and parent-teacher meetings.
- Infrastructure gaps: Develop hybrid digital-offline models focusing on underserved areas.
- Teacher preparation: Establish national certification and peer learning groups for continuous support.
- Standardization of assessment: Use centralized rubrics, external moderation, and technology-based scoring.

Conclusion

Reimagining India's assessment system through modular and competency-based approaches offers a student-centered, inclusive, and future-ready model. Anchored in NEP 2020 and global best practices, these reforms shift focus from rote learning to mastery, flexibility, and real skill development. Modular assessments reduce stress and foster continuous feedback, while competency-based education emphasizes demonstrated learning over time spent in class. International examples from Finland, the U.S., and the UK guide adaptation to India's context. With support from NEP and institutions like PARAKH, successful implementation demands teacher training, stakeholder engagement, and systemic planning to build an equitable, resilient, and globally relevant education system.

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