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## Indian Knowledge Systems in India's National Education Policy (NEP) 2020

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### ABSTRACT

The National Education Policy (NEP) 2020 positions Indian Knowledge Systems (IKS) as a vital resource for reimagining education in India, from early childhood to higher education and research. This paper analyses how NEP 2020 integrates IKS to nurture holistic learning, ethical values, creativity, and contextual problem-solving. It reviews the policy's vision, situates it in the literature on indigenous knowledge and decolonial curriculum, maps NEP's actionable provisions related to IKS, and examines their implications for curriculum design, pedagogy, teacher education, assessment, and higher education reform. Drawing on emerging implementations, the paper identifies challenges—including curricular overload, teacher capacity, research rigor, and risk of tokenism—and offers a practical roadmap and evaluation metrics to realize IKS as a living, evolving knowledge ecosystem aligned with global standards. The paper concludes that IKS integration can enrich India's knowledge economy, strengthen cultural rootedness with global readiness, and foster sustainable development, provided it is pursued with academic rigor, inclusivity, and interdisciplinary research.

### KEYWORDS

National Education Policy 2020; Indian Knowledge Systems; IKS; curriculum reform; teacher education; indigenous knowledge; multilingualism; foundational literacy; higher education; research.

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### INTRODUCTION

The National Education Policy 2020 is India's first comprehensive education reform of the 21st century, aiming to deliver equitable, high-quality, and holistic education. A distinctive emphasis of the policy is on Indian Knowledge Systems (IKS)—the diverse, multimillennial knowledge traditions of the

subcontinent spanning languages, literature, arts, sciences, mathematics, architecture, agriculture, health, philosophy, ethics, law, and environmental stewardship. NEP 2020 calls for integrating IKS with contemporary disciplinary knowledge to inspire inquiry, innovation, and civic responsibility.

### 2. CONCEPTUAL FRAMEWORK AND LITERATURE BACKGROUND

Indigenous knowledge scholarship emphasizes the value of local epistemologies for sustainable development, cultural identity, and cognitive diversity. Research argues that integrating indigenous knowledge with

modern science deepens learner engagement, supports environmental ethics, and broadens problem-solving repertoires. Decolonial perspectives advocate curricular rebalancing that recognizes multiple knowledge traditions without compromising scientific method or academic standards. In the Indian context, IKS includes

classical knowledge in Sanskrit, Prakrit, Tamil and other languages; medieval and early modern innovations; and living practices in crafts, agriculture, health (e.g., Ayurveda, Yoga), astronomy, and mathematics. The

### 3. NEP 2020: VISION AND PROVISIONS RELEVANT TO IKS

#### NEP 2020 articulates:

Holistic, multidisciplinary education with flexibility, choice-based curricula, and experiential learning.

Promotion of Indian languages, arts, and culture, including classical languages, local arts, and heritage.

Integration of IKS across school and higher education, encouraging research, documentation, translation, and use in contemporary applications.

Teacher preparation that equips educators to teach in multilingual, culturally rooted, and inquiry-driven ways. Institutional reforms such as the four-year multidisciplinary undergraduate program, research-intensive universities, National Research Foundation (NRF), and academic credit frameworks that can host IKS offerings.

These provisions create structural space for rigorous IKS integration alongside international standards and 21st-century skills.

### 4. MAPPING IKS ACROSS THE EDUCATION STAGES

#### 4.1 Foundational Stage (3–8 years)

Storying and play-based learning drawing on Panchatantra, Jataka, regional folktales, and local ecological knowledge.

Local language immersion to build cognitive foundations and cultural belonging.

Sensory arts and crafts (weaving, pottery, folk music, rangoli) for fine-motor development and pattern recognition.

#### 4.2 Preparatory & Middle Stages (8–14 years)

Contextual science: local water cycles, traditional farming methods, biodiversity mapping, indigenous food systems.

Mathematics in culture: combinatorics in classical poetry meters, geometry in temple design, tiling patterns, and kolam.

Civic ethics: dialogic exploration of dharma/nyaya concepts alongside constitutional values and global human rights.

#### 4.3 Secondary Stage (14–18 years)

Choice-based courses on Indian scientific heritage (e.g., Kerala school astronomy-mathematics), linguistics and poetics, Indian aesthetics (rasa), classical logic (Nyaya), design and architecture (vastu as design history), artisanal technologies, and environmental jurisprudence.

framework adopted here treats IKS as plural, critical, evidence-seeking, and evolving, not static or romanticized.

Capstone projects linking IKS with contemporary challenges—waste management via traditional circularity, climate adaptation through indigenous practices, AI ethics through Indian philosophical debates on mind and agency.

### 4.4 Higher Education

Majors, minors, and micro-credentials in IKS; joint degrees with

science/engineering/medicine/management.

Research clusters: manuscripts and digital humanities; traditional health systems; ethnomathematics; sustainable materials and crafts; musicology; linguistics; logic and philosophy of science.

Innovation and incubation leveraging IKS for design, wellness, nutraceuticals, sustainable agriculture, and heritage technologies.

### 5. CURRICULUM AND PEDAGOGIC DESIGN FOR IKS

#### 5.1 Design Principles

1. Rigor and Evidence: Teach IKS with critical methods—textual criticism, historiography, experimental validation, and reproducible research.
2. Plurality and Inclusion: Represent multiple regions, languages, communities, and women scholars/practitioners.
3. Interdisciplinarity: Connect IKS with STEM, social sciences, arts, and policy.
4. Experientiality: Fieldwork, labs, crafts studios, performance, and community projects.
5. Ethics and Sustainability: Emphasize environmental stewardship, public health, and social justice.

#### 5.2 Exemplary Course Modules

IKS-101: Introduction to Indian Knowledge Systems – sources, methods, scope; debates and historiography; contemporary applications.

Ethnomathematics and Design – symmetry, tessellation, prosody, algorithmic patterns in arts/crafts.

Traditional Ecological Knowledge – agro-biodiversity, water harvesting, forest governance; comparative case studies.

Texts and Translation Lab – reading modules across Sanskrit, Tamil, Pali/Prakrit, Persian, and regional literatures; digital tools for philology.

Wellness, Yoga, and Public Health – evidence-based approach to yoga/ayurveda modules; interfacing with biomedicine ethics and trials.

### 5.3 Pedagogies

Inquiry seminars with socratic/dialogic methods rooted in Indian debating traditions (vada, samvada).

Makerspace and living-lab projects with artisans, farmers, and local governments.

Bilingual resources with glossaries and parallel texts to lower linguistic barriers.

### 6. Teacher Education and Capacity Building

Pre-service: Embed IKS foundations and local curriculum design in B.Ed./M.Ed. with practicums in community institutions.

In-service: Modular, stackable online + face-to-face CPD on IKS content knowledge, critical methods, and classroom integration.

Communities of Practice: School–college–artisan–researcher networks; mentorship models; open educational resources (OER) repositories.

Assessment Literacy: Training on authentic assessment (portfolios, exhibitions, field reports) aligned to learning outcomes.

### 7. Assessment and Evaluation Aligned to IKS

Performance-based assessment: craft products, design prototypes, musical recitals, field surveys, ethnographies.

Conceptual assessments: comparative essays on methods across IKS and modern science; logic problem sets; data analysis of fieldwork.

Community impact metrics: biodiversity indices, water quality improvements, circular economy pilots, local entrepreneurship.

Longitudinal tracking: student portfolios across stages; micro-credentials mapped to National Credit Framework.

### 8. Higher Education and Research Ecosystem

Institutional structures: Schools/centres of IKS; interdisciplinary PhD programs; joint appointments with science/engineering.

Research methods: Mixed methods—textual studies, archaeology, experimental replications, RCTs for health modules, design research.

Infrastructure: Manuscript digitization labs, field stations, craft clusters, living heritage labs, open data repositories.

Ethics and IP: Community consent, fair benefit sharing, traditional knowledge digital libraries; IP frameworks for co-created innovations.

## 9. IMPLEMENTATION: OPPORTUNITIES, RISKS, AND MITIGATION

### 9.1 Opportunities

Contextual engagement improves attendance, motivation, and belonging.

Innovation pipelines in sustainable design, wellness, materials, and agri-tech.

Language revitalization and cultural continuity through multilingual learning.

### 9.2 Risks

Tokenism: superficial add-ons without depth or assessment.

Siloing: IKS treated as separate from mainstream disciplines.

Quality variance: unvetted materials or pseudo-scientific claims.

Curricular overload: additions without integration or pruning.

### 9.3 Mitigation Strategies

Rigorous curation via peer-reviewed syllabi and textbooks with annotated primary sources.

Method-first approach emphasizing evidence and critical thinking.

Curriculum mapping to existing competencies; replace rather than add where possible.

Phased implementation with pilots, evaluation, and scaling.

## 10. CASE ILLUSTRATIONS (EMERGING PRACTICES)

1. Water Heritage and STEM: Secondary students survey traditional stepwells/tanks; model hydrology; prototype rainwater harvesting; present data to panchayats.
2. Crafts–Design Studio: College design labs co-create market-ready sustainable products with artisan clusters, documenting traditional techniques and embedding materials science.
3. Texts to Tech: Sanskrit/Tamil poetics inform generative rules for computational creativity; students build simple NLP tools with bilingual corpora and meters.
4. Yoga and Wellbeing: Controlled school-based programs measuring flexibility, attention, and stress indicators; integrated with mental health supports and physical education.

## 11. MONITORING & EVALUATION (M&E) FRAMEWORK

Input indicators: trained teachers in IKS; availability of bilingual/OER materials; partnerships with community knowledge holders.

Process indicators: hours of experiential learning; number of field projects; proportion of courses using authentic assessment.

Outcome indicators: student learning gains in critical thinking, problem-solving, and cultural literacy; community impact metrics; research outputs and

patents/startups.

Equity lenses: representation of regions, languages, communities, and women knowledge-holders in curriculum and research teams.

## 12. POLICY AND INSTITUTIONAL ROADMAP (2025–2030)

1. Standards and Guidelines: Nationally vetted IKS curricular standards with learning outcomes and assessment rubrics per stage.
2. Teacher Workforce: 3-tier credentialing (foundation, practitioner, mentor) with credit-bearing micro-credentials and incentives.
3. Resource Ecosystem: Open repositories of translations, lesson plans, datasets, craft manuals, and virtual tours; encourage bilingual publication.
4. Research Catalysis: Competitive grants for interdisciplinary IKS research; replication studies; community-based participatory research.

## 14. CONCLUSION

IKS integration under NEP 2020 offers a pathway to contextual, high-quality, and future-ready education. By coupling methodological rigor with cultural rootedness, India can educate learners who are globally competent

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5. Quality Assurance: Independent peer review boards; red teams to challenge weak claims; regular public reporting.
6. Scaling Pilots: Annual cohort of district-level pilots with randomized phase-in, rigorous evaluation, and toolkits for replication.

## 13. DISCUSSION

NEP 2020's call to integrate IKS is both transformative and demanding. It can cultivate cognitive flexibility, ethical awareness, and innovation relevant to India's social-ecological realities. Success depends on designing with rigor, avoiding essentialism, and ensuring equitable representation. IKS must dialogue with global science and humanities, contributing novel hypotheses, methods, and designs—not merely heritage appreciation. With robust teacher preparation, research support, and quality assurance, IKS can become a living engine of India's knowledge economy and cultural confidence.

and locally impactful. The roadmap presented here—spanning curriculum, pedagogy, teacher education, research, and M&E—provides actionable steps for institutions to implement NEP's vision while maintaining academic standards and inclusivity.

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