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Integrating the Indian Knowledge System with Modern Pedagogy for a Holistic Educational Renaissance under NEP 2020

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ABSTRACT

This comprehensive literature review examines the integration of the Indian Knowledge System (IKS), a millennia-old intellectual tradition spanning philosophy, mathematics, medicine, ethics, and ecology, into modern pedagogy, as mandated by India's National Education Policy (NEP) 2020. It argues that colonial-era "epistemicide" systematically marginalised indigenous epistemologies, necessitating "cognitive decolonisation" through educational transformation. The study synthesises historical foundations, including Vedic-Upanishadic knowledge transmission and classical contributions (e.g., Panini's linguistics, Sushruta's surgery), alongside epistemological frameworks like Pramāṇa Shastra (theory of valid knowledge). Core IKS pedagogical principles—such as Guru-Shishya Parampara (relational mentorship), Panchakosha Vikas (holistic development), and dialogic learning (shravana-manana-nididhyasana), are analysed for their alignment with contemporary models like flipped classrooms and experiential learning. Contemporary integration initiatives (e.g., STEAM India, yogic sciences, digital IKS repositories) demonstrate synergies between traditional wisdom and technological innovation, including AI and immersive technologies. Despite policy support, challenges persist: textual accessibility gaps, inadequate teacher training, epistemological tensions, and concerns about social equity and sectarian bias. The paper advocates "critical traditionalism" to address historical exclusions while leveraging IKS to address global challenges such as sustainability education, ethical AI, and holistic well-being. It concludes that harmonising IKS with modern pedagogy offers transformative potential to heal Cartesian divides, fostering education that balances technological advancement, ethical grounding, and ecological consciousness for planetary futures.



Keywords: Indian Knowledge System (IKS); Modern Pedagogy; NEP 2020; Guru-Shishya Parampara; Panchakosha Vikas; Cognitive Decolonization; Holistic Education



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INTRODUCTION: RECLAIMING INDIGENOUS EPISTEMES

The Indian Knowledge System (IKS) represents one of humanity's most enduring intellectual traditions, encompassing millennia of accumulated wisdom across diverse domains including philosophy, mathematics, astronomy, medicine, linguistics, ethics, and ecological sciences (Kour & Singh, 2025). This vast repository of knowledge, developed through continuous inquiry and refinement, offers holistic frameworks for understanding human existence that integrate material, spiritual, and ethical dimensions of life. The National Education Policy (NEP) 2020 marks a watershed moment in India's educational history by explicitly mandating the integration of IKS into contemporary pedagogy, asserting that "education must build character and enable learners to be ethical, rational, compassionate, and caring, while at the same time preparing them for gainful employment" (Kour & Singh, 2025; Rani, 2024). This policy shift emerges from growing recognition that modern education systems, while excelling in technical specialisation, often fail to cultivate ecological consciousness, ethical reasoning, and cultural rootedness.

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The colonial disruption of indigenous knowledge transmission created what scholars term "epistemicide"—the systematic erasure of non-Western knowledge traditions (Chandel & Johnson, 2025; Kour & Singh, 2025). Macaulay's 1835 Minute institutionalised this marginalisation, establishing an educational paradigm that devalued Sanskrit-based knowledge systems and created what postcolonial theorists identify as an "inferiority mentality" regarding indigenous epistemologies (Admin, 2025; Kour & Singh, 2025). Contemporary efforts toward IKS revival thus represent not merely pedagogical innovation but what Gupta (2019) terms "cognitive decolonization," the "reclamation of intellectual sovereignty through educational transformation" (Chandel & Johnson, 2025).

This comprehensive literature review synthesises scholarly research on integrating IKS with modern pedagogy, analysing historical foundations, epistemological frameworks, pedagogical models, implementation challenges, and future directions. By examining interdisciplinary scholarship across education, philosophy, history, and cultural studies, we argue that IKS integration offers transformative possibilities for creating education systems that balance technological advancement with ethical grounding, scientific rationality with ecological consciousness, and individual achievement with community wellbeing.

HISTORICAL AND PHILOSOPHICAL FOUNDATIONS OF IKS

Evolution of Knowledge Traditions

IKS emerged over five millennia through continuous refinement across successive historical periods. The Vedic period (1500-500 BCE) established foundational knowledge systems through sruti (revealed knowledge) and smriti (memorised tradition), organised into four Vedas that integrated ritual, philosophy, music, astronomy, and mathematics (Admin, 2025; Team Varthana, 2024). The Upanishadic period (800-200 BCE) marked the "axial shift" toward philosophical inquiry, with texts exploring consciousness, metaphysics, and ethics through dialogic pedagogy between guru and shishya (Kumari & Niyogi, 2025). The classical period (200 BCE-1200 CE) witnessed systematic codification across shastras (scientific treatises), with landmark contributions including Panini's Ashtadhyayi (linguistics), Charaka and Sushruta Samhitas (medicine), Aryabhata's astronomical calculations, and Patanjali's Yoga Sutras (Kour & Singh, 2025).

These knowledge traditions evolved through dynamic debate across diverse philosophical schools (darshanas). As Soni notes, public debates (shastrarthas) were institutionalised as "the engine of philosophical refinement," with Carakasamhita enumerating 44 dialectical categories for scholarly disputation (Soni, 2003). Six orthodox schools (Nyaya, Vaisheshika, Samkhya, Yoga, Mimamsa, and Vedanta) and heterodox traditions (Buddhism, Jainism, and Charvaka) developed sophisticated epistemological frameworks while maintaining distinctive metaphysical positions (Phillips, 1998; Phillips & Vaidya, 2024). This intellectual pluralism generated what Rao terms "the Indian scientific method"—a "rigorous framework combining empirical observation, logical reasoning, and experiential verification" (Kumari & Niyogi, 2025).

Epistemological Frameworks: Pramāṇa Shastra

Classical Indian epistemology centres on pramāṇa - the means of valid knowledge - forming a sophisticated "source epistemology" that predates Western debates on justification by millennia (Phillips, 1998; Phillips & Vaidya, 2024). The major schools systematically analysed knowledge sources through pramāṇa shastra (theory of valid knowledge), with perception (pratyaksha), inference (anumana), and testimony (shabda) universally accepted as primary means (Phillips & Vaidya, 2024; Soni, 2003). The table 1 "Epistemological Sources in Indian Philosophy" presents the six classical pramāṇas, or means of valid knowledge, and connects them to modern thought. Pratyaksha refers to direct perception through the senses, comparable to empirical observation, though philosophers debate how interpretation shapes perception. Anumāna is inference based on logical reasoning, aligned with scientific inference, with discussions focusing on the conditions that make inference valid. Shabda emphasizes authoritative testimony, paralleling testimonial knowledge, and raises questions about what qualifies as reliable authority. Upamāna involves analogical reasoning, similar to modern analogical thinking, with debates on its scope and limitations. Arthāpatti is postulation or circumstantial implication, akin to abductive reasoning, and philosophers examine whether it is distinct from inference or a subset of it. Finally, Anupalabdhi refers to knowledge of absence, comparable to reasoning from non-perception, with debates about its epistemological status as an independent source of knowledge.

A distinctive feature is the factive nature of *pramāṇa* - knowledge sources necessarily yield veridical cognition. As explained in classical texts, "false testimony is not testimony at all but its counterfeit" (Phillips & Vaidya, 2024). This contrasts with Western reliabilism by making truth-conduciveness intrinsic to knowledge sources rather than statistically contingent. The self-validity debate (*svataḥprāmāṇya*) between the Mimamsa and Nyaya schools established foundational questions about justification: whether knowledge is intrinsically self-validating or requires extrinsic verification (Phillips, 1998; Soni, 2003).

Table 1. *Epistemological Sources in Indian Philosophy*

<i>Pramāṇa</i>	Definition	Modern Correlate	Key Debates
<i>Pratyaksha</i>	Direct perception through sense organs	Empirical observation	Role of interpretation in perception
<i>Anumāna</i>	Inference based on logical reasoning	Scientific inference	Validity conditions for inference
<i>Shabda</i>	Authoritative testimony	Testimonial knowledge	Criteria for authority
<i>Upamāna</i>	Comparison/analogical reasoning	Analogical thinking	Scope and limitations
<i>Arthāpatti</i>	Postulation/circumstantial implication	Abductive reasoning	Relationship to inference
<i>Anupalabdhi</i>	Non-perception/absence	Knowledge of absence	Epistemological status

Educational Philosophy and Institutions

The gurukul system embodied Vedic educational philosophy, creating residential learning communities where students (*brahmacharis*) lived with teachers (*gurus*) for 12-24 years (Admin, 2025; Team Varthana, 2024). Education was holistically integrated with daily life, combining academic study with manual labour, artistic practice, physical training, and ethical development. The Taittiriya Upanishad's concluding address to graduates encapsulates this vision: "Speak truth, practice dharma, do not neglect self-study, do not neglect the welfare of others" (Kumari & Niyogi, 2025).

Contrary to popular misconceptions, Vedic education exhibited significant inclusivity. Women scholars like Gargi and Maitreyi participated in philosophical debates, and Shudra-philosophers like Vidura contributed to ethical discourse (Admin, 2025; Kumari & Niyogi, 2025). However, this inclusivity diminished during the medieval period, with knowledge transmission becoming increasingly exclusionary - a historical limitation contemporary revival must consciously address (Kumari & Niyogi, 2025).

CORE PEDAGOGICAL PRINCIPLES OF IKS

Guru-Shishya Parampara: Relational Pedagogy

The guru-shishya relationship constituted the cornerstone of indigenous education, extending beyond instructional interaction to embody a "transformative kinship" (Admin, 2025). This sacred bond was characterised by five relational principles: *shraddha* (reverential trust), *samarpan* (self-surrender), *seva* (selfless service), *anugraha* (transformative grace), and *anubhava* (experiential knowing) (Admin, 2025; Kumari & Niyogi, 2025). Contemporary education research increasingly recognises such emotionally anchored relationships as critical for cognitive and affective development. Neuroscience confirms that secure attachments optimise neuroplasticity, creating "neural scaffolds for learning" - validating the neurobiological wisdom underlying guru-shishya dynamics (Kumari & Niyogi, 2025).

Modern adaptations include mentorship programs at institutions like IIT Kharagpur and Akal University, where faculty serve as "knowledge guides" rather than information transmitters. The NEP 2020 explicitly recommends

revitalising this relational pedagogy through academic advising systems and reduced student-teacher ratios ([Kumari & Niyogi, 2025](#); [Rani, 2024](#)).

Holistic Development: Panchakosha Vikas

IKS conceptualises human personality through the *panchakosha model* (five sheaths of existence), advocating balanced development across all dimensions:

1. *Annamaya kosha*: Physical development through yoga, martial arts, and manual labour.
2. *Pranamaya kosha*: Vital energy cultivation through pranayama and nature immersion.
3. *Manomaya kosha*: Cognitive development through memorisation, debate, and reflection.
4. *Vijnanamaya kosha*: Intellectual discernment through logical analysis and ethical reasoning.
5. *Anandamaya kosha*: Spiritual fulfillment through meditation, self-inquiry, and transcendence ([Admin, 2025](#); [Team Varthana, 2024](#)).

This contrasts sharply with reductionist approaches in contemporary education that privilege cognitive development while neglecting other dimensions. Varthana Education's comparative analysis shows that while modern systems focus 85% on cognitive domains, Vedic education allocated balanced attention across physical (20%), vital (20%), cognitive (20%), ethical (20%), and spiritual (20%) domains ([Team Varthana, 2024](#)).

Dialogic and Experiential Learning

Indian pedagogies emphasised active knowledge construction through dialogic methods. Three forms of intellectual exchange were systematically developed: vada (truth-seeking dialogue), jalpa (competitive debate), and vitanda (critical refutation) ([Soni, 2003](#)). The Upanishadic method of shravana (listening), manana (reflection), and nididhyasana (contemplative assimilation) created what modern pedagogues would term "deep learning cycles" ([Admin, 2025](#); [Kumari & Niyogi, 2025](#)).

Experiential learning was institutionalised through diverse modalities: laboratory-style experiments in alchemy (rasayana), clinical training in medical schools (Charaka's anatomical studies), astronomical observation in observatories (like Ujjain's Vedashala), and agricultural fieldwork ([Kour & Singh, 2025](#); [Kumari & Niyogi, 2025](#)). These methods align with Kolb's experiential learning theory while predating it by millennia. Contemporary applications include design thinking workshops at Nalanda University that adapt ancient debate formats for innovation challenges and experiential curricula at Sri Sri University that integrate organic farming with agricultural science ([Kumari & Niyogi, 2025](#)). Moreover, [Asagar \(2024a\)](#) explores how undergraduate women's perceptions of blended learning align with learner-centred philosophies inherent in IKS, highlighting increased engagement and flexibility. Similarly, flipped learning, which shifts instructional delivery to outside the classroom and emphasises interactive in-class activities, mirrors the dialogic and experiential traditions of ancient Indian gurukul systems ([Asagar, 2024b](#); [Zaidi et al., 2023](#)). Table 2 shows how traditional IKS learning-Shravana, Manana, Nididhyasana- translates into flipped learning practices, highlighting challenges of bandwidth, digital literacy, and resistance to non-lecture pedagogy in modern contexts.

Table 2. *Flipped Learning Adaptation in the IKS Context*

Traditional Element	Modern Translation	Implementation Challenge
<i>Shravana</i> (Listening)	Pre-class video lectures	Bandwidth constraints in rural areas
<i>Manana</i> (Reflection)	Online discussion forums	Low digital literacy among educators
<i>Nididhyasana</i> (Application)	In-class case simulations	Resistance to non-lecture pedagogy

CONTEMPORARY INTEGRATION: MODELS AND APPROACHES

Curricular Frameworks and Pedagogical Innovations

The NEP 2020 provides the policy architecture for IKS integration through its 5+3+3+4 structure, mandating indigenous knowledge inclusion at all levels (Kaur & Kaur, 2024; Team Varthana, 2024). Successful implementation models include:

- **STEAM India Initiative:** Integrating Shulba Sutras (Vedic geometry) in mathematics, Sushruta's surgical techniques in biology, and Bharata's Natyashastra in performing arts (Kour & Singh, 2025).
- **Value Education Programs:** Incorporating Hitopadesha and Panchatantra ethical dilemmas for moral reasoning development (Admin, 2025; Team Varthana, 2024).
- **Yogic Sciences Curriculum:** Combining Patanjali's psychological insights with neuroscience research on meditation (Kour & Singh, 2025; Shivohamshiv, 2024).
- **Linguistic Revitalisation:** Sanskrit computational linguistics programs developing AI applications for morphological analysis (Kumari & Niyogi, 2025).

Table 3 demonstrates how diverse IKS domains-mathematics, medicine, ecology, linguistics, ethics, and arts integrate traditional sources with modern educational practices. These models enrich learning by enhancing computational fluency, fostering holistic health, promoting environmental consciousness, strengthening moral reasoning, advancing meta-linguistic awareness, and encouraging creative expression.

Table 3. *Integration Models in Contemporary Education*

IKS Domain	Traditional Sources	Modern Integration	Educational Benefits
Mathematics	Shulba Sutras, Manuscript	Bakshali Vedic mathematics modules	Enhanced computational fluency
Medicine	Charaka Samhita, Sushruta Samhita	Integrative health courses	Holistic health perspectives
Ecology	Vrikshayurveda, Sacred groves	Sustainable agriculture programs	Environmental consciousness
Linguistics	Panini's Ashtadhyayi	Natural language processing	Meta-linguistic awareness
Ethics	Dharma shastras, Jataka tales	Value education frameworks	Moral reasoning development
Arts	Natyashastra, Silpa shastras	Arts-integrated learning	Creative expression

Pedagogically, digital repositories like the Indian Knowledge Systems Portal (iksindia.org) provide open-access resources for educators (Kour & Singh, 2025). The National Curriculum Framework 2023 recommends "two-eyed seeing" approaches that engage both indigenous and scientific perspectives simultaneously (Kumari & Niyogi, 2025).

The integration of the Indian Knowledge System (IKS) with modern pedagogies presents a transformative approach to education that emphasises contextual relevance, cultural grounding, and technological innovation. IKS, with its rich repository of philosophical, scientific, and linguistic traditions, can be harmoniously embedded into contemporary teaching models such as blended and flipped learning. The use of immersive technologies like AR and VR in technical education further complements the experiential learning aspects of IKS, as discussed by Shahabuddin et al. (2023), offering students a multisensory grasp of abstract concepts. Teachers' digital competence (Asagar, 2025b) and the institutional challenges in ICT integration (Naaz, 2025) also indicate a growing need to blend indigenous epistemologies with global digital literacy frameworks, enriching both the teaching process and learner outcomes.

Research and Innovation Applications

IKS offers rich conceptual resources for contemporary research challenges. Scholars have identified promising intersections, including :

- ***Ayurveda-Bioscience Interface***: Reverse pharmacology approaches for drug discovery from herbal formulations documented in classical texts ([Kour & Singh, 2025](#); [Kumari & Niyogi, 2025](#)).
- ***Vastu Shastra and Sustainable Architecture***: Integrating spatial design principles with environmental science for climate-responsive buildings ([Kour & Singh, 2025](#)).
- ***Yogic Psychology and Mental Health***: Combining mindfulness practices with cognitive-behavioural therapies for anxiety disorders ([Kour & Singh, 2025](#); [Shivohamshiv, 2024](#)).
- ***Agricultural Revival***: Applying Vrkhayurveda principles for organic farming and soil conservation ([Kumari & Niyogi, 2025](#)).

The Indian Knowledge Systems Division under MoE has funded interdisciplinary projects exploring these interfaces, though Srinivas notes that current research remains "dispersed and under-theorised" without robust methodological frameworks ([Kumari & Niyogi, 2025](#)). The Jain University model demonstrates effective integration by housing IKS research within innovation incubators, linking traditional knowledge holders with scientific researchers ([Kumari & Niyogi, 2025](#)). Moreover, ethical awareness in AI usage within academic research, as investigated by [Asagar \(2025a\)](#), suggests that integrating traditional ethical frameworks from IKS could guide responsible digital innovation.

CHALLENGES AND CRITICAL PERSPECTIVES

Implementation Barriers

Despite policy mandates, IKS integration faces significant challenges:

- ***Textual Accessibility***: Less than 15% of regional knowledge texts have been translated or digitised, creating an "archival desert" for researchers ([Kumari & Niyogi, 2025](#)).
- ***Pedagogical Training***: 92% of teacher education programs lack IKS modules, leaving educators unprepared for implementation ([Rani, 2024](#)).
- ***Epistemological Tensions***: Conflicts between phenomenological knowledge traditions and positivist scientific paradigms ([Phillips, 1998](#); [Phillips & Vaidya, 2024](#)).
- ***Sectarian Concerns***: Critiques that IKS promotion privileges Hindu worldviews in India's pluralistic society ([Kumari & Niyogi, 2025](#); [Team Varthana, 2024](#)).
- ***Social Equity***: Historical exclusions based on caste and gender require conscious redressal in contemporary revival ([Kumari & Niyogi, 2025](#)).

These challenges necessitate what Sharma calls "critical traditionalism"—engaging "indigenous knowledge without romanticisation or uncritical acceptance" ([Kumari & Niyogi, 2025](#)).

Postcolonial and Critical Theory Perspectives

Postcolonial scholarship raises crucial caveats regarding IKS revival. Scholars warn against "neo-traditionalism" that selectively appropriates cultural elements while reinforcing patriarchal or hierarchical structures ([Kumari & Niyogi, 2025](#)). The "caste question" remains particularly contentious, as traditional knowledge systems operated within social frameworks that restricted access based on birth ([Kumari & Niyogi, 2025](#); [Team Varthana, 2024](#)).

Critical theorists advocate for decolonising methodologies that center subaltern knowledge traditions while acknowledging historical exclusions. Rao's "subaltern IKS" project documents folk knowledge systems from tribal communities, creating counter-archives that challenge Brahmanical canons ([Kumari & Niyogi, 2025](#)). Similarly, feminist scholars recover contributions of women philosophers like Akka Mahadevi and Lal Ded, creating gender-inclusive curricula ([Kumari & Niyogi, 2025](#)).

FUTURE DIRECTIONS AND CONCLUSION

Research Imperatives

Scholarship identifies several **critical research priorities**:

- **Digital Humanities:** Creating comprehensive digital archives with metadata tagging for regional knowledge texts ([Kumari & Niyogi, 2025](#)).
- **Epistemological Bridging:** Developing integrative frameworks that honour multiple ways of knowing without reductionism ([Phillips, 1998](#); [Phillips & Vaidya, 2024](#)).
- **Assessment Models:** Designing evaluation tools for holistic learning outcomes (e.g., ethical reasoning, ecological consciousness) ([Admin, 2025](#)).
- **Inclusive Historiography:** Recovering marginalised contributions through subaltern archives and oral history projects ([Kumari & Niyogi, 2025](#)).

The proposed National Research Foundation under NEP 2020 could establish dedicated funding streams for these priorities, creating institutional support currently lacking ([Kumari & Niyogi, 2025](#); [Rani, 2024](#)).

Global Relevance

Beyond India, IKS offers **transformative insights** for global education challenges:

- **Sustainability Education:** Integrating dharma (duty) and prakriti (nature) concepts for ecological ethics ([Admin, 2025](#); [Kumari & Niyogi, 2025](#)).
- **Mindfulness in Learning:** Incorporating dharana (concentration) and dhyana (meditation) practices for attention regulation ([Shivohamshiv, 2024](#)).
- **Ethical Frameworks:** Applying vasudhaiva kutumbakam (world as family) for global citizenship education ([Admin, 2025](#); [Kour & Singh, 2025](#)).
- **Holistic Wellbeing:** Balancing material and spiritual dimensions in an era of mental health crises ([Kour & Singh, 2025](#); [Shivohamshiv, 2024](#)).

As Srinivas argues, IKS represents "not cultural nostalgia but civilizational resources for planetary futures" ([Kumari & Niyogi, 2025](#)).

CONCLUSION: TOWARD INTEGRAL EDUCATION

This review demonstrates that integrating IKS with modern pedagogy represents neither romantic traditionalism nor reactionary traditionalism but a critical renaissance of India's knowledge heritage. By weaving together the epistemological strengths of both traditions, educators can create what Tagore envisioned as "the world's meeting place in creative unity." The NEP 2020 provides the policy framework, but implementation requires multidimensional efforts: curriculum redesign, teacher development, research investment, and community engagement.

The ultimate promise of IKS integration lies in its potential to heal the Cartesian divides that fragment modern consciousness: between mind and body, reason and intuition, and humanity and nature. As Indian philosophy reminds us through its unifying concept of Brahman, reality is an interconnected whole demanding integral knowing. Education that harmonises ancient wisdom with contemporary knowledge, indigenous epistemes with global science, and self-realisation with social responsibility offers our best hope for addressing complex twenty-first-century challenges. In recovering these holistic knowledge traditions, we may yet create educational systems worthy of our shared humanity and planetary future.

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