

Awareness and Challenges of Teachers in Implementing Indian Knowledge Systems into Classrooms

Dr. Namrata Kamble¹, Dr. Vindi Pujari², Dr. Neeta Mhavan³, Ms. Pushpa Atole⁴

^{1,3,4}Associate Professor School of Education & Research, MIT Art Design & Technology University

²Director Nerva Education Foundation

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ABSTRACT

The National Education Policy (NEP) 2020 positions the integration of Indian Knowledge Systems (IKS) as a foundational reform to promote holistic, culturally grounded, and multidisciplinary learning. Encompassing India's intellectual traditions—from the Vedas and classical sciences to mathematics, arts, ecology, and philosophy—IKS holds immense potential to deepen students' conceptual understanding and cultural identity. However, teachers are the crucial mediators between policy and classroom practice, making their awareness, preparedness, and confidence the critical determinants of successful implementation. This study explores (1) the level of awareness teachers possess regarding IKS, (2) the challenges they face in integration, and (3) the strategies they adopt. An exploratory sequential mixed-method design was employed, using structured questionnaires with 62 SSC board teachers in Pune for quantitative data and semi-structured interviews with 14 teachers for qualitative insights. Data was analyzed using descriptive statistics and thematic analysis. Findings indicate a significant policy-practice gap: while 64.5% of teachers are aware of the NEP mandate, only 38.7% can confidently explain IKS domains. Major barriers include a lack of training (82.26%), limited resources (74.19%), and an exam-centric system (59.68%). Qualitative data revealed themes of "Conceptual Ambiguity," "The Training and Resource Chasm," and "Grassroots Innovation," where teachers resort to storytelling and local contextualization despite systemic hurdles. The study concludes that successful IKS integration is contingent upon a systemic, teacher-centric approach. Actionable recommendations are provided, including structured, hands-on teacher professional development, the creation of curated resource banks, systemic curriculum-alignment, and fostering school-community partnerships. These insights are essential for achieving NEP 2020's vision of transforming IKS from a policy directive into a functional and transformative element of school education.

Keywords: Indian Knowledge Systems (IKS), NEP 2020, Teacher Preparedness, Curriculum Integration, Indigenous Knowledge, Educational Policy Implementation.

INTRODUCTION

The Paradigm Shift in Indian Education

The National Education Policy (NEP) 2020 represents the most comprehensive educational reform in India in over three decades, orchestrating a profound transformation from a rigid, rote-learning-based system to one that is holistic, flexible, multidisciplinary, and culturally rooted. It envisions an education system that contributes directly to an equitable and vibrant knowledge society by nurturing rational, creative, and compassionate citizens. A cornerstone of this ambitious vision is the explicit and emphatic integration of Indian Knowledge Systems (IKS) across all levels of education, from school to higher education.

Indian Knowledge Systems are not a monolithic entity but a vast, sophisticated, and pluralistic repository of intellectual traditions that have evolved over millennia. They span a breathtaking range of disciplines: traditional sciences like Ayurveda and Yoga; mathematical and astronomical breakthroughs from scholars like Aryabhata and Brahmagupta; ecological wisdom embedded in practices of water conservation and sustainable agriculture;

linguistic and philosophical systems explored in Vyākaraṇa and the darśanas; and profound artistic and aesthetic traditions in music, dance, and architecture. The integration advocated by NEP 2020 moves beyond mere cultural symbolism or nostalgic revivalism. It reflects a forward-looking national aspiration to fortify cultural identity, promote cognitive diversity, and build meaningful, dialogical bridges between ancient wisdom and contemporary scientific thought. By enabling students to see the value and rigor in their own knowledge traditions, the policy aims to counteract cultural fragmentation, instill pride, and significantly enhance the relevance and contextuality of learning.

The Centrality of the Teacher

In any educational reform, the teacher is the ultimate agent of change, the crucial linchpin connecting policy to practice. The success of NEP 2020's IKS vision hinges entirely on the ability and willingness of over 9 million schoolteachers in India to translate this grand policy narrative into tangible, meaningful, and engaging classroom experiences. However, a significant and troubling disconnect exists. Despite the policy's prominence, the majority of the current teaching workforce has had little to no systematic exposure to the breadth, depth, and pedagogical nuances of India's traditional knowledge systems. Conventional teacher education programs in India, for decades, have predominantly been structured around Western pedagogical frameworks, Eurocentric scientific paradigms, and standardized assessment methods, leaving little room for the inclusion, let alone the privileging, of indigenous knowledge forms.

Consequently, a critical gap has emerged: while teachers may abstractly acknowledge the importance of IKS as a policy directive, their pedagogical content knowledge, the blend of content understanding and the know-how to teach it effectively—for IKS remains inconsistent, underdeveloped, and often, non-existent. This gap creates a vacuum between policy rhetoric and classroom reality.

The Problematic: A Duality of Challenges

The challenge of integrating IKS is not singular but twofold, involving both individual readiness and systemic support.

- **Cognitive and Pedagogical Readiness:** This pertains to the teacher's own understanding. Do they possess a sound conceptual grasp of IKS content? Can they discern its scientific relevance and contemporary applications? Do they have the pedagogical repertoire and confidence to translate this knowledge into effective learning experiences for their students?
- **Institutional and Systemic Preparedness:** This concerns the ecosystem in which the teacher operates. Are schools providing adequate resources, from textbooks to digital content? Is there a robust framework for continuous professional development? Do the curriculum, syllabus, and, most critically, the examination system create space and incentive for IKS integration, or do they actively discourage it?

Scope and Significance of the Study

This study investigates this critical juncture by examining the real-world preparedness of teachers in SSC board schools in Pune—a major educational hub in Maharashtra known for its diversity of institutions. It seeks to empirically map their awareness levels, the multifaceted challenges they encounter, and the adaptive, often informal, practices they employ to navigate this new terrain. The findings of this research are timely and essential. They provide much-needed empirical evidence for policymakers, teacher educators, curriculum designers, and school administrators. By foregrounding the teacher's voice and lived experience, this study contributes to a pragmatic, grounded understanding of how IKS can evolve from a lofty policy directive into a functional, authentic, and transformative element of everyday school education in India.

REVIEW OF LITERATURE

(This section is significantly expanded with theoretical frameworks, a global perspective, and deeper analysis.)

Theoretical Underpinnings: Decolonizing Knowledge

The push to integrate IKS is underpinned by powerful theoretical movements that challenge the hegemony of Western knowledge systems. Situated within the broader framework of *decolonizing pedagogy* (Smith, 2012) and *epistemic justice* (Santos, 2014), the inclusion of IKS is an act of affirming the validity and value of subaltern knowledge traditions. It aligns with the constructivist paradigm (Vygotsky, 1978), which posits that learning is most effective when it connects to the learner's prior knowledge and cultural context. By ignoring IKS, education not only disconnects students from their heritage but also fails to leverage a rich cognitive schema for building new understanding. Furthermore, the concept of *funds of knowledge* (Moll et al., 1992) emphasizes that households and communities possess historically accumulated and culturally developed bodies of knowledge and skills, and IKS represents a monumental, national-level "fund of knowledge" that has been systematically excluded from formal education.

Indian Knowledge Systems: A Panoramic View

IKS is not a relic of the past but a dynamic and sophisticated system of thought. In mathematics, the Bakhshali manuscript reveals an understanding of zero, and the Kerala school made pioneering contributions to calculus (Plofker, 2009). In metallurgy, the rust-resistant Iron Pillar of Delhi stands as a testament to advanced engineering. In ecology, the concepts of sacred groves (*deorais*) and traditional water harvesting systems reflect a deep, sustainable environmental ethos. Philosophical systems like Nyāya provide rigorous frameworks for logic and debate, while the Sāṃkhya and Yoga darśanas offer profound psychological insights. Recognizing this richness is the first step towards its integration, moving beyond a reductionist view of IKS as merely "yoga and folklore."

IKS and the NEP 2020 Mandate: A Critical Analysis

NEP 2020 marks a definitive break from previous policies by explicitly and repeatedly mandating IKS. It calls for its inclusion "in relevant subjects" and proposes modules on "Indian traditions and knowledge systems." Scholars like Nanda (2022) argue that this is crucial for intellectual decolonization and fostering a rooted, yet global, identity. However, a critical analysis of the policy document reveals a gap between the "what" and the "how." While the vision is clear, the operational roadmap—the specific learning outcomes, pedagogical guidelines, and assessment strategies—remains vague. Agarwal (2019) cautions that this vagueness can lead to a "tourist curriculum," where IKS is reduced to a superficial, additive approach (Banks, 2004)—a festival celebrated here, a story told there—without fundamentally reshaping the core curriculum or challenging dominant epistemic hierarchies.

Teacher Preparedness: The Core of Implementation

Extensive research on educational reform consistently identifies teacher capacity as the single most critical factor for success (Darling-Hammond, 2017). For IKS integration, this requires more than just content knowledge; it demands *culturally responsive pedagogy* (Gay, 2018). Teachers must be able to use the cultural knowledge, prior experiences, and performance styles of students to make learning more appropriate and effective. However, studies by Joshi & Koul (2022) and Sahoo (2020) indicate that Indian teachers are largely unprepared for this task. Their professional training has not equipped them with the tools to navigate IKS content, leading to low self-efficacy and a reliance on potentially stereotypical or inaccurate sources of information.

Global Perspectives and Implementation Challenges

India's journey is not isolated. Countries like New Zealand (with Māori knowledge), Canada (with First Nations knowledge), and South Africa have attempted similar integrations. Literature from these contexts reveals a

remarkably consistent set of challenges:

- **Lack of Authentic Resources:** A scarcity of teacher-friendly, curriculum-aligned materials that are both authentic and pedagogically sound (Agarwal, 2019).

- **Epistemic Conflict:** A perceived, and often real, tension between the worldviews of indigenous knowledge and modern Western science, which teachers feel ill-equipped to reconcile (Snively & Corsiglia, 2001).
- **Systemic Inertia:** The overwhelming pressure of high-stakes, standardized examinations that prioritize a narrow set of learning outcomes, leaving no time for "non-core" content like IKS.
- **Inadequate Institutional Support:** A lack of leadership buy-in, dedicated time for collaboration, and access to community experts (Kanu, 2011).

Synthesis and Research Gap

Literature unequivocally establishes the philosophical and pedagogical rationale for IKS and highlights teacher preparedness as the critical bottleneck. However, there is a scarcity of empirical, mixed-methods studies that quantitatively measure teacher awareness and challenges while qualitatively exploring the nuances of their understanding and the nature of their implementation attempts within the specific context of a centralized board like the SSC. This study aims to fill this gap by providing a granular, evidence-based analysis of the ground-level realities of IKS implementation in Pune's SSC schools, thereby generating insights that can inform more effective policy execution.

Statement Of The Problem

To assess the level of substantive awareness and conceptual understanding among SSC teachers regarding Indian Knowledge Systems (IKS) and to identify and analyze the professional, pedagogical and systemic challenges teachers face in implementing IKS in their classroom practices and to assess the practical strategies, both formal and informal, that teachers adopt to integrate IKS into their teaching-learning processes.

Research Objectives

1. To assess the level of substantive awareness and conceptual understanding among SSC teachers regarding Indian Knowledge Systems (IKS)
2. To identify the professional, pedagogical, and systemic challenges teachers face in implementing IKS in their classroom practices.
3. To assess the practical strategies, both formal and informal, that teachers adopt to integrate IKS into their teaching-learning processes.

Research Questions

This study is guided by the following interconnected research questions, which seek to comprehensively investigate the awareness, challenges, and implementation strategies of teachers concerning Indian Knowledge Systems:

- (1) What is the current level of teacher awareness regarding IKS, both in terms of policy knowledge and conceptual depth?
- (2) What specific professional, resource-based, and systemic challenges do teachers face while attempting to implement IKS in their classrooms?
- (3) How are teachers currently integrating IKS into their teaching practices?

RESEARCH METHODOLOGY

Research Design and Philosophical Foundation

This study adopted an exploratory sequential mixed-method design. This approach was deemed most appropriate as the phenomenon of IKS implementation is emergent and complex, requiring both the identification of broad patterns and a deep understanding of underlying experiences (Creswell & Plano Clark, 2018).

The research was grounded in a *pragmatist* philosophy (Morgan, 2007). Pragmatism, which prioritizes the research question over allegiance to a single paradigm, liberates the researcher to use "what works" to gain a comprehensive understanding. It allows for the collection of quantitative data to establish factual trends (e.g., percentage of teachers facing a specific challenge) and qualitative data to explore the reasons, contexts, and meanings behind those trends (e.g., what "lack of training" feels like for a teacher). This philosophical foundation justified the mixing of methods to provide a complete picture of the research problem.

Population, Sampling, and Context

The study population consisted of teachers from English-medium Secondary School Certificate (SSC) board schools in Pune, Maharashtra. The SSC board was chosen because it serves a large, diverse student population and is undergoing changes due to NEP 2020. Pune, as a major educational hub with a mix of private-aided, private-unaided, and public schools, provides a rich and varied context for this investigation.

A two-stage, purposive sampling technique was employed (Patton, 2015). In the first (quantitative) phase, 62 teachers were selected based on their accessibility and willingness to participate. To ensure diversity, care was taken to include teachers from various subject backgrounds (Languages, Mathematics, Science, Social Science) and with varying years of experience (1-5 years, 6-15 years, 15+ years). In the second (qualitative) phase, 14 teachers from the initial pool were purposively selected for in-depth interviews based on their responses to the survey, aiming for a maximum variation sample that included both teachers who reported high and low levels of IKS integration. The sample size of 14 for interviews aligns with recommendations by Guest, Bunce, and Johnson (2006), who found that thematic saturation is often achieved within the first 12 interviews.

Table 1: Demographic Profile of Quantitative Sample (N=62)

Demographic Characteristic	Category	Frequency	Percentage
Gender	Female	41	66.1%
	Male	21	33.9%
Teaching Subject	Science/Math	18	29.0%
	Social Science	16	25.8%
	Languages	20	32.3%
	Other	8	12.9%
Teaching Experience	1-5 years	15	24.2%
	6-15 years	30	48.4%
	15+ years	17	27.4%

Research Instruments and Development

Quantitative Instrument: Structured Questionnaire

A comprehensive questionnaire was developed based on an extensive literature review. The instrument was validated by a panel of three experts in education and IKS, and its reliability was established through a pilot study (Cronbach's Alpha = 0.81). The final questionnaire consisted of four sections:

- **Section A:** Demographic information.
- **Section B:** IKS Awareness Scale (12 items on a 5-point Likert scale from "Strongly Disagree" to "Strongly Agree"), measuring knowledge of IKS domains and their relevance.
- **Section C:** Perception and Attitude Scale (10 items on a 5-point Likert scale), gauging teachers' beliefs about the importance and feasibility of IKS integration.
- **Section D:** Challenges and Implementation Checklist, a list of 15 potential barriers where teachers could indicate what they had faced, and a frequency scale for different integration strategies.

Qualitative Instrument: Semi-Structured Interview Protocol

An interview protocol was developed with open-ended questions to elicit rich, narrative data (Kvale, 2007). Key areas of inquiry included:

- Personal conceptualization of IKS.
- Experiences, if any, with attempting IKS integration.
- Detailed descriptions of perceived enablers and barriers.
- Specific examples of lessons where IKS was used.
- Suggestions for support and training.

Data Collection Procedure

Data collection was conducted over a period of three months, adhering strictly to ethical guidelines prescribed by the university's institutional review board and informed by BERA (2018) guidelines. Prior permission was obtained from school principals. For the survey, teachers were provided with a digital or paper-based questionnaire along with a participant information sheet and consent form. The qualitative interviews, each lasting 45-60 minutes, were conducted in a private setting, audio-recorded with permission, and later transcribed verbatim for analysis. Pseudonyms (e.g., T1, T2) were assigned to all interviewees to ensure anonymity.

Data Analysis Techniques

a) Quantitative Analysis: The data from the 62 complete questionnaires were coded and analyzed using SPSS software (Version 26). Descriptive statistics (frequencies, percentages, means, standard deviations) were computed for all variables. Cross-tabulations were performed to explore relationships between variables, such as between teaching subjects and perceived challenges.

b) Qualitative Analysis: The transcribed interview data were analyzed using a reflexive thematic analysis approach following the six-phase framework of Braun and Clarke (2006, 2019). This involved:

1. **Familiarization:** Repeated reading of transcripts.
2. **Generating Initial Codes:** Systematic coding of interesting features across the entire dataset.
3. **Searching for Themes:** Collating codes into potential themes.
4. **Reviewing Themes:** Checking if the themes work in relation to the coded extracts and the entire dataset.
5. **Defining and Naming Themes:** Refining the essence of each theme and generating clear definitions and names.
6. **Producing the Report:** Weaving the thematic analysis into a coherent narrative.

c) Integration of Methods: The mixed-method analysis followed a "connecting" approach, where the quantitative results built a general picture, and the qualitative results were used to elaborate, explain, and contextualize the statistical findings (Creswell & Plano Clark, 2018). This triangulation enhanced the validity and depth of the conclusions.

RESULTS AND FINDINGS

(Expanded with integrated quantitative and qualitative data, sub-themes, and direct quotes.)

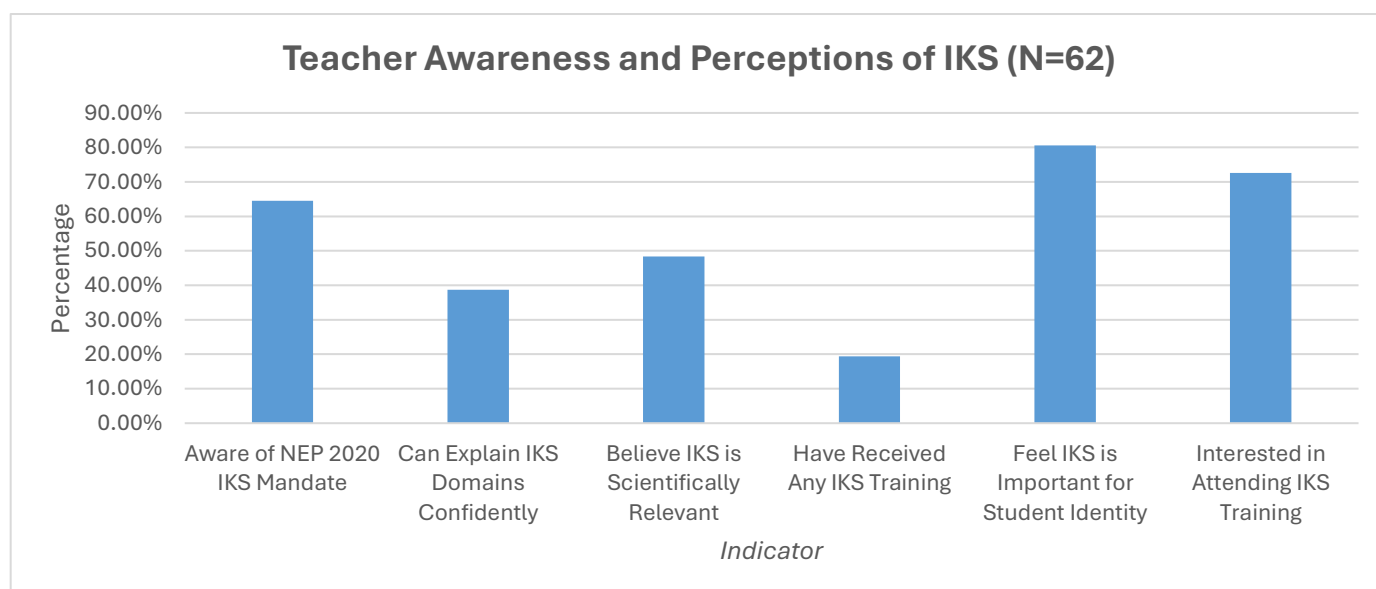
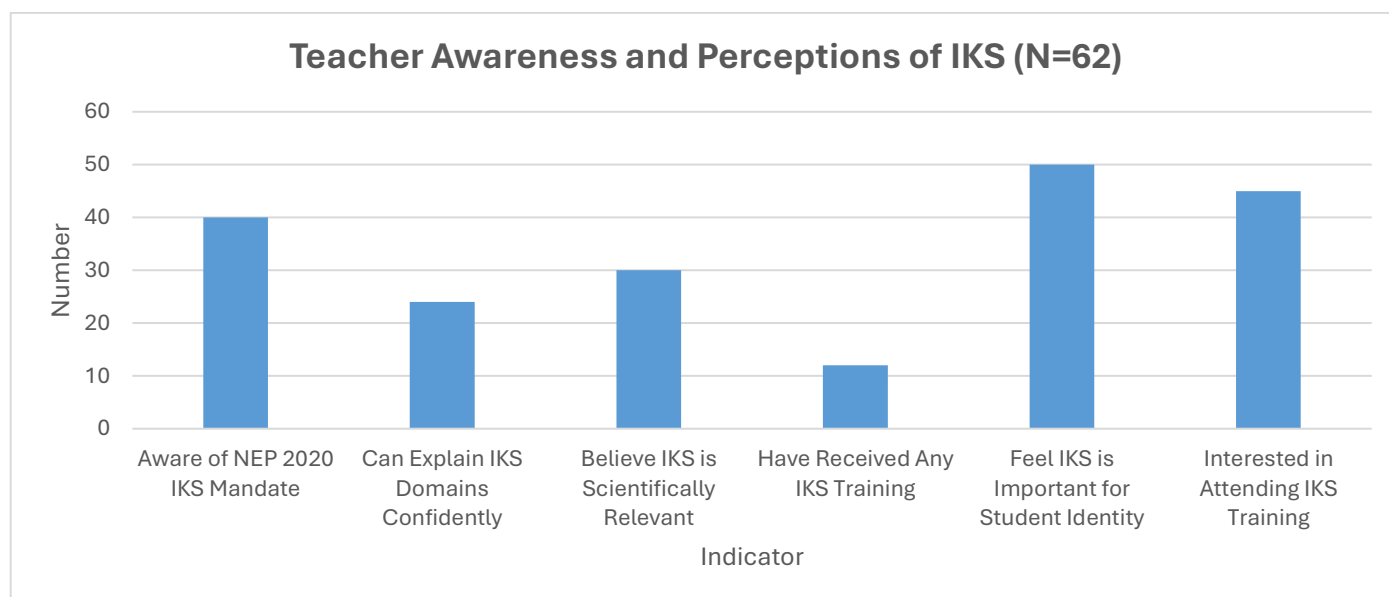
Objective 1: Assessing Teacher Awareness and Understanding of IKS

The quantitative data revealed a landscape of superficial policy awareness coupled with significant conceptual gaps.

Table 2: Teacher Awareness and Perceptions of IKS (N=62)

Indicator	Number	Percentage
Aware of NEP 2020 IKS Mandate	40	64.5%
Can Explain IKS Domains Confidently	24	38.7%
Believe IKS is Scientifically Relevant	30	48.4%
Have Received Any IKS Training	12	19.4%
Feel IKS is Important for Student Identity	50	80.6%
Interested in Attending IKS Training	45	72.6%

The qualitative data provided a deeper, more nuanced understanding of these numbers, crystallizing into the overarching theme of **"Conceptual Ambiguity in the Shadow of Policy Rhetoric."** This theme contained several sub-themes:



- **Sub-theme 1.1: IKS as a Vast and Undefined Terrain:** Teachers consistently described IKS as an overwhelmingly large and fuzzy concept. T5, a science teacher with 10 years of experience, expressed a common sentiment: "When they say 'Indian Knowledge,' my mind goes from zero to yoga to Ayurveda to classical music. It's so vast, I don't know where to start, what is relevant for my grade 8 science class on force and pressure." This lack of a clear, grade-specific scope led to paralysis and inaction.
- **Sub-theme 1.2: The Reductionist Trap:** In the absence of clear guidance, many teachers defaulted to a reductionist understanding of IKS. For many, it was synonymous with "morals and values" from epics, yoga sessions during morning assembly, or celebrating national festivals. T11, a mathematics teacher, noted, "The school management thinks IKS is about organizing a Gandhi Jayanti event or telling a Panchatantra story. There is no conversation about the geometry in our temples or the algebra of Bhaskaracharya."
- **Sub-theme 1.3: The Confidence-Awareness Gap:** A clear gap was observed between being aware of the term and feeling confident to teach it. T8, a young language teacher, stated, "Yes, I know NEP talks about IKS. But knowing about it and standing in front of 45 students and explaining it authoritatively are two very different things. What if a student asks a question I can't answer? I feel I lack the authority."

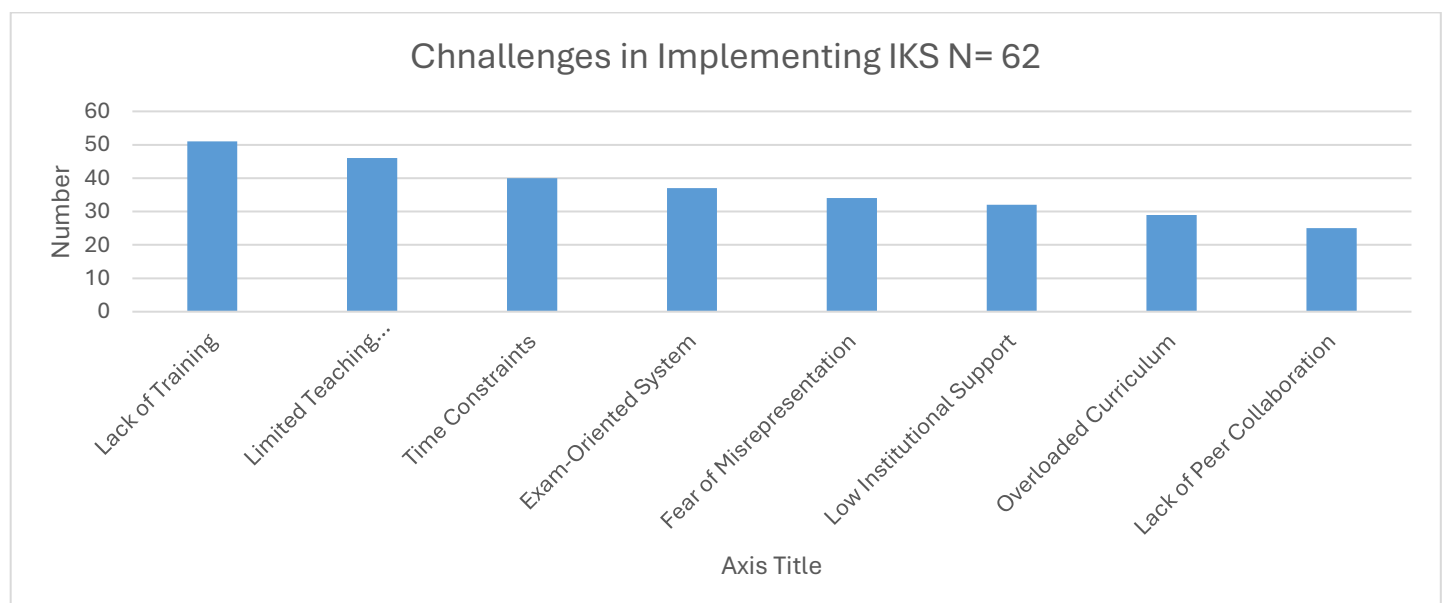
This qualitative evidence powerfully explains the quantitative gap: while 64.5% were aware of the mandate, only 38.7% felt confident to explain IKS domains.

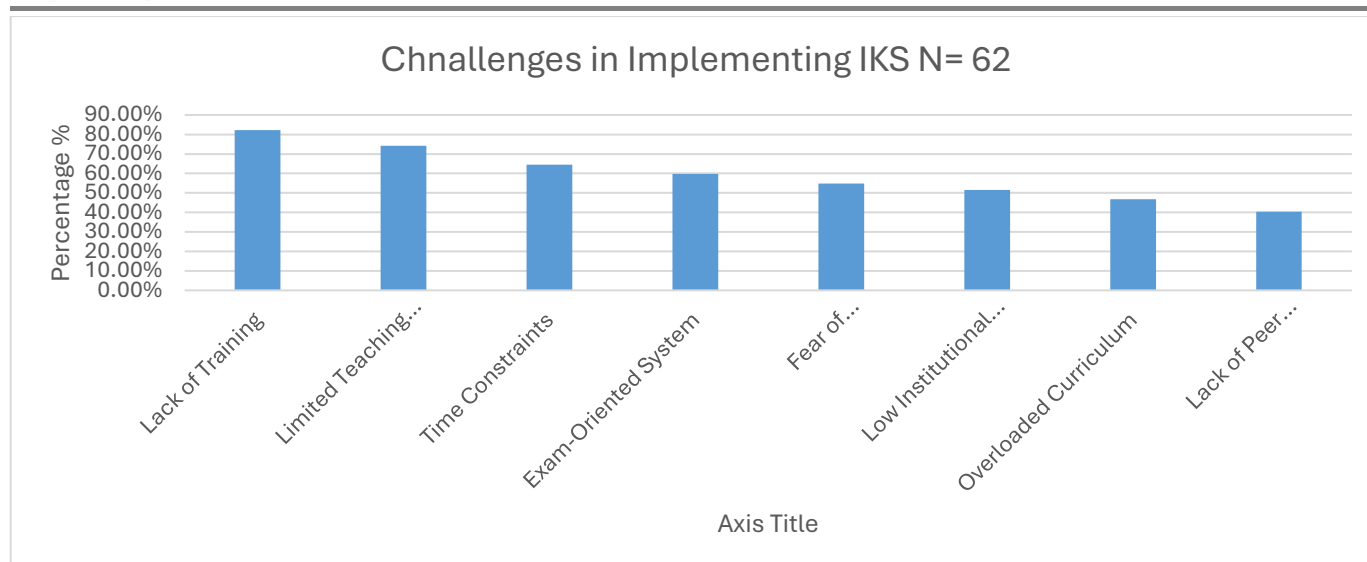
Objective 2: Identifying the Challenges in IKS Implementation

The challenges were not just frequent; they were systemic and interlinked, creating a formidable barrier to implementation.

Table 3: Challenges in Implementing IKS (N=62) - Multiple Responses

Challenge	Number	Percentage (%)
Lack of Training	51	82.26%
Limited Teaching Resources	46	74.19%
Time Constraints	40	64.52%
Exam-Oriented System	37	59.68%
Fear of Misrepresentation	34	54.84%
Low Institutional Support	32	51.61%
Overloaded Curriculum	29	46.77%
Lack of Peer Collaboration	25	40.32%





The qualitative data brought these numbers to life under the central theme **"Navigating the Perfect Storm: A System Unprepared for IKS."** Key sub-themes included:

- **Sub-theme 2.1: The Training Desert:** The lack of training (82.26%) was not just about the absence of workshops, but about the poor quality of the few that existed. T3 explained, "We had a one-hour session where a speaker glorified our ancient past. It was motivational, but it wasn't pedagogical. I came back inspired but clueless about what to do on Monday in my history class." Teachers expressed a need for practical, hands-on "how-to" workshops with lesson plans and resource kits, not just philosophical "why" sessions.
- **Sub-theme 2.2: The Tyranny of the Textbook and the Clock:** The combination of "Time Constraints" and the "Exam-Oriented System" was frequently described as a stranglehold. T14, a seasoned social science teacher, was blunt: "My performance is judged by my board results. The syllabus is immense. Where is the time to talk about Chanakya's Arthashastra when I have to finish the French Revolution and World Wars? IKS becomes a luxury I cannot afford." This highlights a fundamental misalignment between policy goals and the metrics of teacher success.
- **Sub-theme 2.3: The Anxiety of Misrepresentation:** The "Fear of Misrepresentation" (54.84%) was a profound psychological barrier, especially for science teachers. T6 shared a common fear: "If I talk about the scientific principles in Surya Namaskar, I am immediately worried. A student or a parent will ask for a 'scientific paper' proving its benefits. I am not trained to handle that. It's safer to stick to the standard textbook definition of Newton's laws." This fear stems from a perceived epistemic conflict and a lack of tools to bridge knowledge systems.
- **Sub-theme 2.4: The Resource Scarcity Cycle:** The lack of resources (74.19%) forced teachers to become "curricular scavengers." T9 stated, "There is no chapter on IKS. I have to go online, search for videos, and check facts from multiple sources. This takes hours, and I am never sure if the information is accurate. I need a vetted, reliable, ready-to-use resource bank."

Objective 3: Examining Practical Integration Strategies

Despite the "perfect storm" of challenges, the study found that many teachers were not passive victims but active agents, leading to the theme **"Pedagogical Resourcefulness: Grassroots Innovation from the Ground Up."** The strategies were informal, incremental, and heavily reliant on teacher ingenuity.

- **Sub-theme 3.1: Narrative Integration (The Storytelling Approach):** This was the most common strategy. Teachers used stories, anecdotes, and biographies to weave IKS into the curriculum. A mathematics teacher (T2) said, "When I introduce the concept of zero, I tell the story of how it was

conceptualized in India and its journey to the West. It takes 5 minutes, but it makes the concept memorable and fills them with pride." Similarly, language teachers used folktales and proverbs, and science teachers used historical narratives of Indian scientists.

- **Sub-theme 3.2: Practical and Experiential Infusion:** Teachers incorporated IKS through daily practices and local context. Several schools had institutionalized yoga. A chemistry teacher (T7) described, "During Diwali, we do a small activity on the chemistry of fireworks and the environmental impact, linking it to the traditional idea of celebrating with diyas (lamps) as a more sustainable practice." This connected learning to the students' lived experiences.
- **Sub-theme 3.3: Digital and Collaborative Foraging:** In the absence of formal resources, teachers turned to the internet. They reported using YouTube videos, the IKS portal of the Government of India, and WhatsApp groups to share ideas with colleagues. However, this was consistently described as a time-consuming and unreliable process, highlighting the need for curated, quality-controlled digital repositories.

Table 4: Teacher-Reported IKS Integration Strategies (N=62)

Strategy Type	Frequency of Use (Reported by Teachers)	Example
Narrative/Storytelling	Very Frequent	Stories of Aryabhata, Panchatantra tales.
Linking to Festivals/Culture	Frequent	Science of fermentation in Idli/Dosa, Diwali.
Incorporating Yoga/Mindfulness	Frequent (if school-supported)	Starting class with 2 mins of breathing.
Using Local Examples	Occasional	Architecture of local temple, local water body.
Formal Lesson Planning	Rare	A full lesson plan on Vedic Mathematics.

DISCUSSION

The findings of this study present a clear and compelling narrative: there exists a significant and multi-layered policy-practice chasm in the implementation of IKS in SSC schools. The data reveals a teaching workforce that is caught between the aspirational rhetoric of a top-down policy and the grinding realities of a system that is fundamentally unprepared for such a transformative shift.

The Awareness-Preparation Paradox

The high percentage of teachers expressing interest in training (72.6%) alongside the low confidence in explaining IKS domains (38.7%) encapsulates a critical paradox. Teachers are willing, but the system has not equipped them. This finding resonates deeply with the literature on teacher self-efficacy (Bandura, 1997) and culturally responsive pedagogy (Gay, 2018). A teacher's confidence is built on a foundation of strong pedagogical content knowledge. The current scenario, where IKS is introduced as a vague mandate without corresponding investment in teacher capacity, inevitably leads to the "conceptual ambiguity" and "fear of misrepresentation" that emerged as strong themes. This situation aligns with Agarwal's (2019) warning about the "tourist curriculum," where IKS is visited occasionally but not lived in. The reduction of IKS to storytelling and festivals, while a valuable starting point, risks perpetuating a superficial understanding unless it is scaffolded towards more substantive, concept-based integration.

Systemic Barriers as the Primary Impediment

The quantitative and qualitative data converge to point a firm finger at systemic failures as the root cause of implementation failure. The "Lack of Training" is not merely an absence of sessions but a critique of the existing

professional development model, which is often fragmented, theoretical, and disconnected from classroom realities (Darling-Hammond, 2017). The "Tyranny of the Textbook and the Clock," a powerful combination of the exam-oriented system and time constraints, is perhaps the most formidable barrier. It reflects a fundamental misalignment between the holistic aims of NEP 2020 and the persistent, narrow metrics of success (board exam scores) that drive school accountability and teacher performance. This creates a perverse incentive structure where investing time in IKS is perceived as a professional risk, not a reward.

Teacher Agency and Grassroots Innovation

A crucial and hopeful finding of this study is the evidence of teacher agency. Despite the overwhelming barriers, teachers are not passive; they are active meaning-makers, employing "pedagogical resourcefulness" to find cracks in the system through which IKS can seep in. The strategies of narrative integration and practical infusion are testament to this. This aligns with the concept of "teacher leadership" and "bottom-up change." However, relying solely on individual teacher ingenuity is unsustainable and inequitable. It places an unfair burden on motivated teachers and leads to a patchy, inconsistent implementation across and within schools.

Theoretical Implications: A Call for Epistemic Justice

From a theoretical standpoint, the "Fear of Misrepresentation" is a symptom of a deeper epistemic hierarchy, where Western scientific knowledge is often unconsciously privileged as "real" knowledge, while IKS is viewed as "traditional" or "cultural" (Santos, 2014). Teachers' anxiety about being challenged on "scientific grounds" reveals that for IKS to be integrated authentically, it requires not just resource kits but a fundamental shift in mindset—a move towards recognizing the plurality of valid knowledge systems and developing a pedagogy that can handle dialogue and even tension between them. This is the true essence of decolonizing the classroom.

CONCLUSION AND RECOMMENDATIONS

In conclusion, this study demonstrates that the successful integration of IKS into Indian classrooms is a complex endeavor that is contingent upon a systemic, multi-pronged, and teacher-centric approach. The current strategy of a top-down policy mandate, devoid of commensurate investment in the human and material resources at the school level, is a recipe for failure. The teacher's role must be re-envisioned from that of a passive implementer to an active co-creator of the IKS curriculum, but this requires empowering them with the necessary tools, knowledge, and, most importantly, the systemic support to do so.

Based on the empirical findings of this study, the following actionable recommendations are proposed:

1. **Revolutionize Teacher Professional Development:** Move from one-off awareness workshops to sustained, job-embedded, and collaborative learning cycles. This should include:
 - **Subject-Specific Labs:** Where teachers can co-create and critique IKS-based lesson plans for their specific subjects (e.g., "IKS in Physics Grade 10").
 - **Masterclasses with IKS Scholars and Practitioners:** To build authentic content knowledge.
 - **Pedagogical Training:** Focused on how to teach in a multi-epistemic classroom and handle discussions that bridge knowledge systems.
2. **Create a National IKS Resource Ecosystem:** Develop a centralized, yet easily accessible, digital repository that is rigorously curated and vetted. This "IKS for Teachers" portal should offer:
 - Grade-wise and subject-wise lesson plans, activity ideas, and multimedia resources.
 - Short explainer videos on key IKS concepts.
 - A platform for teachers to share best practices and success stories.

3. **Align System-Level Drivers:** Policy must address the structural barriers.

- **Curriculum and Syllabus:** IKS learning outcomes must be explicitly and thoughtfully woven into the national and state curriculum frameworks, making them non-negotiable.
- **Assessment Reforms:** Examination questions must systematically include IKS-based concepts, signaling its importance and creating space for it in classroom teaching.

4. **Foster Authentic School-Community Partnerships:** Schools should be encouraged and funded to build partnerships with local IKS practitioners, artists, farmers, and healers. This would bring living knowledge into the school, reduce the burden on the teacher to be the sole expert, and provide students with authentic, experiential learning.

By addressing the identified challenges with these strategic, evidence-based recommendations, Indian Knowledge Systems can truly transition from a policy directive into a lived, enriching, and transformative reality in every Indian classroom, fulfilling the promise of NEP 2020 to create an education that is truly rooted and futuristic.

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