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Digital Pedagogies and the Indian Knowledge System: Pathways to Revitalization

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Abstract



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Digital technologies offer unprecedented opportunities to preserve and disseminate India's rich traditional knowledge (Ayurveda, Yoga, philosophy, arts, etc.) to modern learners. Integrating online tools (MOOCs, e learning platforms, digital archives, virtual reality) into higher education can bridge gaps between ancient wisdom and contemporary pedagogy. Recent policy initiatives (NEP 2020) and programs (SWAYAM, DIKSHA, IKS Wiki) explicitly encourage this blending of tradition and technology. Scholarly reviews report that IT-enhanced courses, blended models and digital humanities projects make IKS materials more accessible and engaging. However, experts also caution that digital approaches must be culturally sensitive and inclusive, lest the digital divide and homogenizing tendencies undermine local knowledge. This review surveys Indian and international studies on digital pedagogy for IKS domains, including case studies and government initiatives. It finds growing evidence that thoughtful use of online learning, archives and virtual platforms can revitalize IKS in higher education, while emphasizing the need to address access and authenticity challenges.

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INTRODUCTION

The Indian Knowledge System (IKS) encompasses millennia-old wisdom in fields such as philosophy, linguistics, medicine (Ayurveda), spirituality (Yoga), arts and natural sciences. This vast tradition, encoded in. Regional languages offer insights relevant to sustainability and holistic development today. The National Education Policy (2020) explicitly calls for integrating IKS into curricula across levels, recognizing India's cultural heritage as a living resource. For example, guidelines now mandate that all undergraduates take at least 5% of credits in IKS-related courses. However, these ancient texts and practices can be hard to access: they are often in archaic languages, fragile manuscripts or dispersed expertise. Digital pedagogy-using online tools, e-courses, and multimedia-promises to overcome these barriers. As Nema and Sharma (2025) [29] argue, Digital Humanities (DH) methods can "make these (ancient) texts accessible, comprehensible, and researchable" and integrate IKS into modern education. In parallel, government platforms like SWAYAM (MOOCs) and DIKSHA (school resources) now include IKS content and novel initiatives (e.g. the IKS Wiki) are mobilizing students to contribute digital knowledge resources. This review surveys the literature on how digital pedagogies are being applied to IKS education in higher education, including case studies and critiques.

The Legacy and Potential of the Indian Knowledge System (IKS)

The Indian Knowledge System (IKS) represents a vast and holistic intellectual tradition encompassing disciplines such as philosophy, mathematics, medicine (Ayurveda), architecture (Vāstu), astronomy (Jyotisha), linguistics and ethical education. Scholars like Kapil Kapoor (2005) have emphasized the integrative and interdisciplinary nature of IKS.

Michel Danino (2010) [7] argues for the contemporary relevance of IKS, especially in sustainable living and ecological consciousness, highlighting how ancient practices align with modern environmental needs. Subhash Kak (2001) explores the sophistication of Vedic knowledge systems, particularly in astronomy and computation, revealing a high level of scientific abstraction. Meanwhile, Devi Prasad Chattopadhyaya (1986) outlines the epistemological frameworks of classical Indian logic and inquiry, positioning Indian philosophy as a rigorous and rational tradition. The National Education Policy (NEP) 2020 reaffirms this scholarly stance, advocating for the integration of IKS into mainstream education to enrich curriculum with indigenous epistemologies and promote cultural continuity. Together, these works underline the enduring potential of IKS to contribute meaningfully to global knowledge dialogues when revitalized through modern pedagogical tools.

Digital Pedagogies in Ayurveda and Yoga

Among traditional fields, Ayurveda and Yoga have seen significant digital integration. Scholars note that information technology (IT) has been harnessed for Ayurveda not only in research but also in education. Kumar (2023) [19] reviews how IT tools are applied in Ayurveda – from text mining of classical treatises to developing e-learning platforms. He reports that "integration of information and communication technology in education is providing high-quality Ayurvedic e-learning resources and online courses," leading to new discoveries and broader engagement. For instance, databases of medicinal plants and virtual lab modules help students learn Ayurveda remotely. Similarly, Yoga instruction has migrated online, especially during COVID-19. Preliminary studies suggest benefits (safety, convenience) and challenges (lack of

physical correction) in online Yoga training. Digital technologies (e.g. videos, apps, virtual reality) have enabled students worldwide to practice Yoga postures and philosophy at home, widening access beyond traditional gurukulas. Nema & Sharma (2025)[30] emphasize that digitizing Yoga texts, mantras, and practices (as part of IKS) can preserve these traditions and enrich curricula. In practice, many MOOCs and certificate courses now offer modules on Yoga theory and practice. For example, the SWAYAM platform hosts Yoga/Mindfulness courses for learners and teachers. In sum, case studies indicate that blended learning (videos plus in-person practice) and online courses have begun to revitalize Ayurvedic and Yogic education, making it scalable and attracting new students (Kumar, 2023 [20]; Nema & Sharma, 2025 [30]).

Digital Platforms for Philosophy

Digital platforms have increasingly become vital in transforming philosophical education and research, enabling broader access, interactive learning, and collaborative scholarship. According to Simon Blackburn (2013) [6], online philosophy resources democratize access to classical and contemporary texts, fostering global philosophical discourse beyond traditional academic boundaries. Jonardon Ganeri (2017) [10] highlights how digital archives and databases facilitate the preservation and dissemination of non-Western philosophical traditions, including Indian philosophy, thus challenging Eurocentric narratives. Works by Barry Allen (2016) [3] emphasize the use of multimedia and digital tools to engage learners through visualizations and interactive modules that enhance critical thinking and conceptual understanding. Furthermore, Ferraris and Pias (2015) [9] argue that digital platforms enable new forms of philosophical inquiry, such as

crowdsourcing and virtual seminars, which encourage diverse perspectives and dynamic debates. In the Indian context, digital initiatives like the Digital Shodha (2020) [33] project and e-PG Pathshala (2021) [8] reflect growing efforts to digitize philosophical manuscripts and create accessible online courses, demonstrating how technology can revitalize classical philosophy education in contemporary settings. Collectively, these studies affirm the transformative potential of digital platforms in philosophy, expanding both reach and pedagogical possibilities.

Intersection of Digital Pedagogies and IKS in Contemporary Education

The convergence of digital pedagogies and Indian Knowledge Systems (IKS) marks a pivotal shift in the landscape of Indian education. This intersection not only offers a platform for preserving and disseminating indigenous knowledge but also provides innovative pedagogical strategies that align with the cultural and epistemological context of Indian learners.

Complementary Educational Philosophies:

Indian Knowledge Systems emphasize experiential learning, contextual understanding and holistic development—principles that resonate with contemporary digital pedagogical methods such as personalized learning, gamification, and constructivist approaches. The philosophical underpinnings of IKS, with their emphasis on ethics, interconnectivity and experiential wisdom, align well with the learner-centric and flexible frameworks offered by digital pedagogy” (Kumar & Sharma, 2022) [21].

Technological Mediation of Oral Traditions:

Traditionally, IKS was transmitted orally through the guru-shishya parampara (teacher-disciple tradition), which relied heavily on interpersonal and immersive

learning experiences. Digital tools such as video lectures, podcasts, and virtual reality environments now offer ways to simulate these traditional settings in modern classrooms. As noted by Agrawal (2021) [2], "Digital tools can help replicate the nuances of oral knowledge systems, thus preserving the authenticity of traditional pedagogy in a scalable format" (Agrawal, 2021, *Digital Humanities and Indian Traditions*) [2].

Enhanced Accessibility and Inclusion:

Digital platforms like SWAYAM, DIKSHA, and the Traditional Knowledge Digital Library (TKDL) have democratized access to IKS content. These platforms provide structured learning modules on subjects like Ayurveda, Vedic mathematics, Sanskrit and Indian philosophy, making them accessible to learners across geographical and socioeconomic boundaries (Ministry of Education, 2020) [24]. The use of multilingual interfaces and localized content further ensures inclusion of marginalized communities (NEP, 2020).

Globalization and Preservation of Cultural Identity:

The digitization of IKS enables its dissemination beyond national borders, fostering cultural diplomacy and global awareness of India's intellectual heritage. According to Mishra and Patra (2023) [25], "Digital pedagogies have allowed IKS to transcend traditional limitations, presenting it on global platforms where its academic, spiritual, and practical value can be recognized and appreciated" (Mishra & Patra, 2023) [26].

Curriculum Innovation and Pedagogical Design:

The integration of IKS through digital means promotes interdisciplinary education. For instance, combining Vedic astronomy with

modern astrophysics or Ayurveda with biomedical sciences offers a multidimensional learning experience. The use of interactive simulations, digital storytelling, and e-content enhances engagement and understanding among students (Sen, 2022) [31].

Role of Digital Tools in Preserving, Disseminating and Enhancing IKS

Digital tools have played a transformative role in the preservation of Indian Knowledge Systems by enabling the digitization of ancient manuscripts, oral traditions, and cultural practices that were historically passed down through generations. Projects like the Traditional Knowledge Digital Library (TKDL) have systematically documented over 200,000 formulations from Ayurveda, Siddha, Unani, and Yoga systems, making them available to patent offices globally to prevent biopiracy (Gupta, 2010) [14]. Similarly, the Vedic Heritage Portal provides a digital repository of Vedic texts and rituals in multiple languages and formats, ensuring that sacred knowledge is preserved and accessible (Joshi, 2016) [17]. According to Sen and Bhattacharya (2021) [32], digital preservation of IKS also supports linguistic conservation, particularly of regional dialects, which are essential for understanding traditional texts in their authentic form.

Beyond preservation, digital technologies significantly contribute to the dissemination and enhancement of IKS through educational platforms, multimedia tools, and interactive technologies. Government initiatives such as DIKSHA and SWAYAM offer MOOCs and teacher training programs rooted in IKS, including modules on Vedic mathematics, Indian astronomy, and classical philosophy (Ministry of Education, 2020) [24]. These platforms democratize access to IKS content and promote interdisciplinary learning. Furthermore, technologies like virtual reality

(VR), augmented reality (AR), and 3D visualization are being used to recreate ancient architectural marvels and performative arts, offering immersive learning experiences (Mishra & Patra, 2023) [26]. As Singh and Prakash (2022) [34] argue, such enhancements not only bring traditional knowledge into contemporary relevance but also foster a deeper cultural consciousness among digital-native learners.

MOOCs, Blended Learning and IKS-related Courses

Massive Open Online Courses (MOOCs) and blended learning models have become popular channels for IKS content. The government's SWAYAM portal now hosts several MOOCs on topics like "Indian Knowledge Systems" and "Essentials of Indian Culture," aimed at higher education teachers and students. For example, Roli Pradhan's SWAYAM MOOC *Indian Knowledge System* explicitly "provides a platform for all teachers of higher education to develop awareness about the Indian Knowledge system," aligning with NEP 2020 priorities. Mandavkar (2023) [22] notes that NEP guidelines envision syncing IKS courses to platforms like SWAYAM and NPTEL to reach learners nationwide. This synchronization enables lifelong learning and credit accumulation across geographies. In blended formats, some universities combine online modules (videos, readings) on IKS with hands-on workshops or field visits, reflecting NEP's emphasis on experiential learning. For example, Ayurveda department may use online lectures supplemented by local gurukul sessions or lab practicums. Internationally, MOOCs on Ayurveda and Yoga (often offered by Indian institutions) attract global audiences, helping disseminate IKS knowledge. Studies of MOOCs in India highlight both promise and issues: while platforms like SWAYAM reduce barriers (no tuition, flexible pace), researchers caution that many MOOCs see low completion

unless coupled with local mentorship (Adhikari & Semalty, 2021)[1]. ODL (Open and Distance Learning) programs like NIOS and IGNOU also offer IKS certificates via correspondence and online resources. Collectively, these digital and blended approaches are expanding access to IKS education, though systematic assessments of learning outcomes remain sparse.

Government and Institutional Initiatives

Government policy has strongly promoted digital IKS education. NEP 2020 explicitly incorporates IKS, and follow-up guidelines (2023) require universities to offer credit courses in IKS, including on digital platforms. The IKS Division (MoE) has launched projects like IKS Centres (in HEIs) and scholarship grants. Importantly, it is developing national digital repositories: for instance, the newly announced "IKS Wiki" is envisioned as a state-sponsored online library for Bharatiya Gyan Parampara. This wiki invites student interns to create multi-lingual content on traditional knowledge, aiming to complement Wikipedia with authenticated IKS articles. The initiative signals recognition that authentic IKS content must be curated digitally to reach a broad audience. Other institutional efforts include the Digital Education courses on DIKSHA and ARPIT that incorporate IKS examples. For school and school-to-college transition, the DIKSHA portal offers content on cultural heritage (though mainly for K-12). The national "Bharatiya Gyan Parampara Samvardhan Karyakram" (BGP) is a scholarship scheme to bring traditional scholars into formal academia. Even though BGP is not purely digital, it exemplifies government emphasis on mainstreaming IKS scholars, who often use digital archives and online journals in research. International collaborations (e.g. MOOC consortia with global universities) are also encouraged. In sum, institutional initiatives like SWAYAM,

NPTEL, IKS Wiki and mandate-based digitization (over 1.5 lakh IKS books digitized by HEIs) create a supportive ecosystem. Scholarly critiques note that such top-down programs can inspire innovation but must be balanced with academic rigor and community involvement.

Challenges and Critiques

Despite the promise, digitalization of IKS faces critiques. A key concern is the *digital divide*: as Alsaleh et al. (2024) [4], [5] observe, technology can “exacerbate inequalities in access”. Rural students or under-resourced institutions may lack connectivity or devices to benefit from online IKS content. Without addressing infrastructure and training gaps, digital pedagogy risks privileging urban populations. Moreover, technology-driven dissemination may lead to cultural homogenization: global platforms tend to center dominant narratives, risking “overshadow(ing) local identities”. In the IKS context, scholars warn that decontextualized online presentations of tradition can strip away cultural nuance.

For example, teaching Yoga purely as physical exercise videos may neglect its philosophical context. Thus, many emphasize “culturally sensitive strategies” – e.g. multimedia presentations that include local context, use vernacular languages, and involve traditional teachers (gurus) as content creators. Another critique concerns *pedagogical effectiveness*: not all content transfers well online. Some educators have noted that embodied learning (e.g. practicing Ayurveda diagnoses hands-on) suffers if digitized improperly. Therefore blended models that retain mentorship and hands-on workshops are often recommended. Additionally, questions of authenticity and ownership arise: who curates digital IKS repositories? Some critics urge caution against digital “muktoaba” efforts that might

inadvertently commodify sacred knowledge. Finally, critical digital pedagogy scholars (e.g. Koseoglu et al.) argue that digital tools should democratize knowledge, not reinforce hierarchies. They suggest involving local communities in digitization projects to ensure respectful representation. Overall, while studies highlight success stories of e-learning in IKS, they also call for evaluation of outcomes, attention to access and inclusion and safeguards to preserve the richness of tradition in the digital age.

Conclusion

Digital pedagogies – including online courses, MOOCs, digital archives and virtual learning environments – are increasingly entwined with higher education in traditional Indian knowledge fields. Research shows that these technologies can revitalize IKS by broadening access, engaging new generations, and integrating ancient wisdom into modern curricula. For example, comprehensive e-learning resources in Ayurveda have enabled innovative teaching methods. Government initiatives (NEP 2020, SWAYAM, IKS Wiki) have provided infrastructure and legitimacy for this digital turn. At the same time, the literature underscores that success depends on thoughtful design: courses must be culturally grounded, instructors must be trained, and digital divides must be bridged. Looking ahead, continued interdisciplinary research – combining education theory, technology and IKS scholarship – will be crucial. Universities should conduct and publish case studies on outcomes of blended IKS courses. Collaborative networks can develop shared digital repositories, and pedagogues should evaluate how digital formats affect learning of non-Western content. If these pathways are navigated carefully, digital pedagogy can help ensure that India’s knowledge heritage thrives in the 21st century and beyond.

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No ethical approval was necessary for this study.

Author Contribution

All authors made substantial contributions to the conception, design, acquisition, analysis, or interpretation of data for the work. They were involved in drafting the manuscript or revising it critically for important intellectual content. All authors gave final approval of the version to be published and agreed to be accountable for all aspects of the work, ensuring its accuracy and integrity.

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