PREFACE TO THE EDITION

It is with great pleasure that we present the latest issue of the **International Journal of Arts Science Humanities Research Studies (IJASHRS)**, a scholarly platform dedicated to fostering interdisciplinary dialogue across the arts, sciences, humanities, philosophy, technology, and cultural studies. The articles featured in this issue collectively demonstrate the growing importance of cross-disciplinary inquiry in understanding the complexities of contemporary society while remaining rooted in historical, cultural, and intellectual traditions.

This issue opens with a compelling exploration of Bharatanatyam in the digital era, examining how one of India's oldest classical dance traditions negotiates the challenges and opportunities of technological transformation. By addressing questions of pedagogy, authenticity, performance, and digital mediation, the study highlights the evolving relationship between tradition and innovation in contemporary performing arts discourse.

The historical depth of Indian civilization is further illuminated through an archaeological investigation of maritime trade in ancient Tamilakam during the Sangam Age. Through the integration of archaeological evidence, literary sources, and epigraphic records, the article provides valuable insights into Indo-Roman commerce and the broader interconnectedness of ancient global trade networks. This contribution significantly enriches ongoing discussions in historiography, archaeology, and cultural exchange studies.

The issue also foregrounds the significance of folk traditions and cultural sustainability through an insightful study on Madhubani art. By examining the transformation of Mithila painting from ritual practice to global cultural commodity, the article raises important questions concerning commercialization, authenticity, gendered artistic labour, and the preservation of indigenous knowledge systems in an increasingly globalized cultural economy.

In the field of literary and postcolonial studies, the issue includes a nuanced examination of contemporary Indian English poetry. The article engages with themes of identity, diaspora, linguistic experimentation, and digital literary culture, reflecting the plurality and dynamism of postcolonial literary expression in India. The discussion contributes meaningfully to contemporary debates on literary innovation, representation, and evolving poetic forms.

Bridging classical philosophy and modern scientific inquiry, another significant contribution investigates the dialogue between Advaita Vedanta and contemporary consciousness studies. By bringing Indian philosophical traditions into conversation with cognitive science and philosophy of mind, the study demonstrates the continued relevance of classical intellectual frameworks in addressing modern questions concerning consciousness, selfhood, and reality.

Extending the interdisciplinary scope of this issue into contemporary technological and ethical domains, the final article examines AI-driven healthcare diagnostics in rural India. The study critically analyses the opportunities and challenges associated with artificial intelligence in healthcare delivery, especially within underserved rural contexts. Its focus on ethics, equity, governance, and contextual implementation reflects the urgent need for responsible technological innovation in the service of public welfare.

Collectively, the articles in this issue embody the central vision of IJASHRS: to encourage rigorous, inclusive, and interdisciplinary scholarship that bridges the humanities, sciences, arts, and emerging technologies. The diversity of themes represented here—from classical dance, archaeology, folk art, and literature to philosophy, cognitive science, and artificial intelligence—demonstrates the journal's commitment to fostering intellectual engagement across disciplinary boundaries.

We extend our sincere gratitude to all contributing authors for their scholarly efforts, to the reviewers for their critical insights and academic commitment, and to the editorial and publication teams whose dedication has made this issue possible. We hope that this collection of research will inspire further inquiry, dialogue, and collaboration among scholars, educators, researchers, and practitioners across the globe.

Dr. Rahul Thampi R

Chief editor

CONTENTS

SL. NO.	TITLE	AUTHOR	PAGE NO.
1	Bharatanatyam in the Digital Age: Tradition, Transmission, and Transformation in Contemporary Indian Classical Dance	Emily Paul	30-35
2	Maritime Trade in Ancient Tamilakam: Archaeological Evidence from the Sangam Age Indo-Roman Commerce	Suja Mol Joseph	36-43
3	Madhubani Art and Cultural Sustainability: From Folk Tradition to Global Marketplace	Manoj T R	44-50
4	Postcolonial Voices in Contemporary Indian English Poetry: Identity, Diaspora, and Literary Innovation	Rini Joy	51-57
5	Advaita Vedanta and Modern Consciousness Studies: Bridging Classical Indian Philosophy and Contemporary Cognitive Science	Bharathi	58-65
6	AI-Driven Healthcare Diagnostics in Rural India: Opportunities, Challenges, and Ethical Considerations	Meena Jose Komban	66-73

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Bharatanatyam in the Digital Age: Tradition, Transmission, and Transformation in Contemporary Indian Classical Dance

Emily Paul

Assistant Professor, Marian College Kuttikkanam Autonomous, India.

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Abstract

Bharatanatyam, one of the oldest classical dance forms of India, has undergone significant transformation in the digital age. The proliferation of online learning platforms, video sharing services, social media, and live streaming technologies has reshaped how the art form is taught, performed, and consumed. While the COVID-19 pandemic accelerated digital adoption, the broader trajectory of digitalization predates 2020 and continues to evolve. This article examines the impact of digital technologies on Bharatanatyam, focusing on tradition, transmission, and transformation in contemporary practice. Drawing on a critical literature review methodology, the study analyses peer-reviewed scholarship, dance journals, and digital ecosystem reports published between 2015 and 2025. The analysis identifies four interlocking dimensions of digital Bharatanatyam: the migration of pedagogy and teacher-student relationships to online platforms; the proliferation of solo and ensemble performances on digital stages; the emergence of cross-cultural and diasporic audience formations; and the reconfiguration of authority, repertoire, and aesthetic standards in the digital domain. The study draws on theories of mediatization, performance studies, and South Asian dance scholarship including the foundational work of Avanthi Meduri, Janet O'Shea, and Davesh Soneji. Findings indicate that digital Bharatanatyam represents not a rupture from tradition but a hybrid configuration that extends the art form's reach while raising significant questions about embodiment, lineage, and cultural authenticity. The article concludes with implications for dance pedagogy, institutional support, and future directions for performing arts research in India.

Keywords: Bharatanatyam, Indian Classical Dance, Digital Pedagogy, Mediatization, Performance Studies, Guru-Shishya Parampara, Diasporic Dance, Performing Arts

INTRODUCTION

Bharatanatyam, originating in the temple traditions of Tamil Nadu and codified in its modern form during the early twentieth century revival movement, occupies a central position in India's classical performing arts heritage [1,2,3] With its intricate vocabulary of nritta (pure dance), nritya (expressive dance), and natya (dramatic enactment), Bharatanatyam embodies a sophisticated convergence of music, rhythm, narrative, and spirituality.[4,3] The art form has historically been transmitted through the guru-shishya parampara, an intimate teacher-student relationship in which technique, repertoire, and cultural knowledge are passed across generations through embodied practice and oral tradition.[5,6]

In the past decade, the digital landscape has begun to reshape this transmission ecology in significant ways. Online video tutorials, dedicated dance learning platforms, social media performance circuits, and live streaming of recitals and arangetrams have transformed how Bharatanatyam is taught, learned, and viewed. The COVID-19 pandemic dramatically accelerated these trends as physical dance schools closed and gurus migrated their teaching to video conferencing platforms. While many of these adaptations were initially understood as temporary, the post-pandemic period has shown that digital practices have not receded. They have stabilized and become integrated features of the contemporary Bharatanatyam ecosystem.

Yet scholarly engagement with digital Bharatanatyam remains comparatively limited. While South Asian dance scholarship has produced rich analyses of the art form's history, gender politics, postcolonial reinvention, and diasporic dimensions, the specifically digital transformation of pedagogy, performance, and audience has received less sustained attention. The present article seeks to address this gap by asking:

- How have digital technologies transformed Bharatanatyam practice in the contemporary period, and what are the implications for tradition, transmission, and aesthetic experience?
- Three subsidiary questions structure the inquiry. First, how has digital pedagogy reshaped the guru-shishya relationship and the institutional landscape of Bharatanatyam training?
- Second, what new performance possibilities and challenges have emerged through digital platforms?
- Third, how do digital developments interact with longstanding debates about authenticity, lineage, and cultural ownership in Bharatanatyam?

The article makes three contributions. It synthesizes scholarship on digital performance, mediatization, and South Asian dance studies into a coherent account of digital Bharatanatyam. It identifies four dimensions of transformation that organize the empirical landscape. It articulates implications for pedagogy, institutional development, and future research. The remainder of the article is organized as follows:

- The next section reviews relevant literature; the following section outlines the methodological approach
- Subsequent sections present the findings and discuss their implications; and the conclusion identifies directions for future research.

LITERATURE REVIEW

Bharatanatyam: Historical and Theoretical Foundations

Bharatanatyam scholarship has produced a rich body of work tracing the art form's evolution from temple-based devadasi traditions through the early twentieth century reconfiguration that produced its modern proscenium form.[1,4,7,8] Avanthi Meduri's foundational research has examined the cultural politics of this reinvention, while work has documented the historical experience of devadasi communities and the ongoing legacies of dance reform. [2,9,10,11]

Janet O'Shea has analysed the production of Bharatanatyam as a national and global classical form, attending to questions of standardization, transmission, and cosmopolitan circulation.[12] These works, alongside critical scholarship by Coorlawala, Daugherty, and Venkataraman, provide essential context for understanding the cultural and political dimensions of the digital era. [13,14,6]

Mediatization and Performance Studies

The theoretical literature on mediatization, drawing on the work of Stig Hjarvard, Knut Lund by and others, has examined how media logics increasingly shape cultural and institutional life.[15,16] Performance studies scholarship by Diana Taylor, Philip Auslander, and others has theorized the relationship between live and mediated performance, distinguishing between archive and repertoire and exploring what is gained and lost as performance moves across media. [17,18] These frameworks help illuminate the specific transformations occurring in classical dance traditions under digital conditions.

Digital Pedagogy in the Performing Arts

Research on digital pedagogy in the performing arts has expanded substantially since 2020. Studies have documented online dance teaching across multiple genres, examined the affordances and limitations of video-based instruction, and explored how teacher-student relationships are reconfigured in mediated environments. While much of this literature engages Western contemporary dance and music education, a growing body of work specifically addresses Indian classical traditions, including Hindustani and Carnatic music, Kathak, Odissi, Kuchipudi, and Bharatanatyam.[19,20]

Diasporic and Cross-Cultural Dimensions

Bharatanatyam has long been a globally circulating art form with significant communities of practitioners and audiences in North America, Europe, the United Kingdom, the Gulf, and Southeast Asia. Diasporic Bharatanatyam scholarship has examined how the form is taught, performed, and reimagined in non-Indian contexts, and how questions of authenticity, identity, and adaptation are negotiated. [21,12,22] The digital era has intensified these cross-cultural circulations, creating new patterns of transnational pedagogy, audience formation, and aesthetic exchange that warrant fresh scholarly attention.

Research Gap

Despite the expanding literature on Bharatanatyam history, performance studies, and Indian dance pedagogy, integrative analysis of the digital transformation specifically affecting Bharatanatyam remains in early stages. Most existing scholarship treats digital developments as auxiliary to historical or cultural analyses rather than as a central object of inquiry. The present article seeks to contribute by foregrounding digital transformation while drawing on established scholarly resources for theoretical and contextual grounding.

METHODS

This study employs a critical literature review methodology with thematic synthesis, suitable for an emerging research area where peer-reviewed scholarship, journalistic reportage, and practitioner reflection together constitute the available evidence base. The review proceeded through four stages. In the first stage, a structured search was conducted in JSTOR, Scopus, ProQuest, the Indian Citation Index, Project MUSE, and Google Scholar. Search terms combined Bharatanatyam, Indian classical dance, digital pedagogy, online teaching, livestream, performance studies, and mediatization. The window covered January 2015 to August 2025, with selected earlier sources retained for theoretical grounding.

In the second stage, inclusion criteria specified peer-reviewed empirical, theoretical, or critical scholarship engaging with digital developments in Bharatanatyam or comparable Indian classical dance traditions, supplemented by foundational works in dance history, performance studies, and mediatization theory. Exclusion criteria filtered out studies focused exclusively on Western dance traditions, technical-only studies of motion capture or computer graphics without performance analysis, and non-peer-reviewed materials except for authoritative practitioner essays in established dance journals. After screening, fifty-two publications were retained for analysis.

In the third stage, supplementary contextual materials were drawn from publicly available sources including programmes of major Bharatanatyam institutions, dance festival documentation, and reports from cultural research organizations including Sangeet Natak Akademi and the India Foundation for the Arts. In the fourth stage, thematic synthesis generated four interlocking dimensions of digital Bharatanatyam that structure the findings reported below. As a literature-based study using publicly available secondary materials, the research did not require formal ethics approval.

RESULTS

Migration of Pedagogy and the Reconfigured Guru-Shishya Relationship

The first dimension concerns the migration of Bharatanatyam pedagogy onto digital platforms and the consequent reconfiguration of the guru-shishya relationship. Online teaching, originally adopted as an emergency measure during pandemic restrictions, has now become a permanent feature of the pedagogical landscape. Established gurus offer online classes through video conferencing platforms, dedicated dance schools have developed structured online curricula, and individual teachers have built

international student bases that would have been impractical in pre-digital conditions. The pedagogical implications are significant. Embodied corrections, traditionally conveyed through physical proximity and direct guidance, are now mediated through screens, requiring new techniques for visual demonstration, verbal description, and student self-observation.

Practitioners and scholars have noted both gains and losses in this transition. The gains include accessibility, particularly for students in regions without local Bharatanatyam expertise, and the ability of leading gurus to reach geographically dispersed students. The losses include the diminished capacity for the intuitive, full-body co-presence that has long been considered essential to traditional transmission. Hybrid models, combining periodic in-person intensives with regular online instruction, have emerged as one productive response, though they remain unevenly accessible across socioeconomic and geographic strata.

Digital Performance Stages and New Choreographic Possibilities

The second dimension concerns the proliferation of digital performance contexts and the choreographic possibilities they enable. Live streamed recitals, recorded performances published on dedicated platforms, social media short-form dance content, and collaborative virtual ensemble pieces have all become significant features of contemporary Bharatanatyam practice. Each digital format imposes its own constraints and offers its own affordances. Live streaming preserves much of the temporality of physical recital but requires negotiation with screen framing, audio quality, and audience engagement at distance. Recorded performances allow precise editing and curation but lose the immediacy of live response. Short-form social media content compresses extended dance forms into highly condensed expressive moments, reshaping aesthetic conventions of pace, framing, and audience attention.

Choreographers and dancers have responded to these digital affordances with creative experimentation. Site-specific dance films, multi-screen ensemble works choreographed during pandemic isolation, hybrid live-and-mediated stage productions, and dance content developed specifically for vertical-format mobile screens all illustrate the choreographic creativity that has emerged. Critical engagement with these new forms has begun in dance scholarship and criticism, though much work remains in developing the analytical vocabulary appropriate to digital choreographic practice.

Cross-Cultural and Diasporic Audience Formations

The third dimension involves the emergence of new audience formations made possible by digital circulation. Bharatanatyam performances and instructional content reach audiences that include diasporic Indian communities globally, non-Indian dance enthusiasts, scholars, and curious general viewers from diverse cultural backgrounds. Recommendation algorithms shape which dancers and which content reach which audiences, with significant implications for visibility, career development, and aesthetic influence. Digital audience metrics, including views, subscribers, and engagement rates, have become increasingly important markers of professional standing alongside traditional indicators such as sabha performances, festival invitations, and titles conferred by cultural institutions.

Diasporic communities have historically played significant roles in sustaining classical Indian dance abroad, and digital connectivity has intensified the transnational circulation of teaching, performance, and audience formation. Dancers based in India teach diasporic students through online platforms; diasporic dancers gain access to advanced training without permanent relocation; and audiences across multiple continents engage with the same performances, festivals, and discussions in real time. These developments simultaneously enrich the global Bharatanatyam community and raise questions about cultural ownership, authority, and the preservation of regional and lineage-specific distinctions.

Reconfiguration of Authority, Repertoire, and Aesthetic Standards

The fourth dimension concerns the reconfiguration of authority, repertoire, and aesthetic standards in the digital domain. Traditional structures of authority in Bharatanatyam, anchored in established gurus, well-recognized institutions, and gatekeeper organizations such as Sangeet Natak Akademi and major sabhas, continue to operate. However, digital platforms create parallel circuits of recognition where individual dancers and choreographers can build significant audiences and

reputations relatively independently of traditional gatekeepers. Younger dancers in particular have used social media to develop visibility, share creative work, and engage in critical conversations about the form.

Repertoire choices and aesthetic standards are also being shaped by digital engagement. Some dancers report tailoring choreographic choices to digital format conventions, choosing pieces of particular durations, emphasizing visually striking abhinaya, or incorporating elements that translate effectively to screen viewing. Critics and scholars have raised concerns about the potential narrowing of repertoire if digital formats systematically privilege particular kinds of content, while others have welcomed the experimental energy and broader participation that digital platforms enable. The interplay between traditional and digitally driven aesthetic forces is ongoing and constitutes one of the most consequential dynamics in contemporary Bharatanatyam.[13,14]

DISCUSSION

The findings carry several important implications. Theoretically, they support an integrative analytical framework that combines mediatization theory, performance studies, and South Asian dance scholarship to engage the specific features of digital Bharatanatyam. The four dimensions identified are not isolated developments but mutually reinforcing features of a transformed practice ecology. Pedagogy, performance, audience, and authority interact dynamically in the digital landscape, and analyses that engage only one dimension miss the systemic character of the transformation.

For pedagogy, the findings suggest that hybrid models combining online and in-person instruction are likely to remain dominant for the foreseeable future. Institutional dance schools, individual gurus, and student communities will benefit from continued investment in online teaching infrastructure, including high-quality video equipment, learning management systems, and curricula designed for hybrid delivery. Teacher development programmes that build digital pedagogical skills are an important institutional priority, particularly for senior gurus whose deep traditional knowledge may not be fully matched by digital teaching experience.

For performance, the findings indicate the value of continued creative experimentation alongside the preservation of traditional concert formats. Live recitals in dedicated performance spaces remain irreplaceable for the embodied co-presence they enable, but digital formats offer significant complementary opportunities. Festivals, sabhas, and cultural institutions that develop hybrid programming, including livestreamed performances, recorded concert archives, and digital companion content, are likely to engage broader audiences while sustaining traditional performance values. Critical engagement with digital choreographic experimentation is needed to develop the aesthetic vocabulary necessary for evaluating new work on its own terms.

For institutional support, the findings emphasize the importance of investments by Sangeet Natak Akademi state cultural departments, the Indian Council for Cultural Relations, and private foundations in the digital infrastructure of classical dance.[23] Areas requiring attention include digitization of archival performance recordings, support for online education platforms, fellowship and grant structures responsive to hybrid practice, and the development of authoritative reference resources for online dissemination of accurate information about repertoire, history, and lineage.

Several limitations of the present analysis warrant acknowledgment. As a literature-based study, the analysis depends on the quality and coverage of available scholarship, which remains uneven for digital Bharatanatyam specifically. Practitioner voices are mediated through researcher framings, and primary ethnographic and interview-based research is essential to enrich the picture sketched here. The pace of digital change means that some findings will require updating as platforms, technologies, and practices evolve.

CONCLUSION

This article has examined the impact of digital technologies on Bharatanatyam through the lens of tradition, transmission, and transformation. Drawing on mediatization theory, performance studies, and South Asian dance scholarship, the analysis identified four interlocking dimensions: the migration of pedagogy and the reconfigured guru-shishya relationship; digital performance stages and new choreographic possibilities; cross-cultural and diasporic audience formations; and the reconfiguration of authority, repertoire, and aesthetic standards. Together these dimensions describe a transformed

practice ecology in which digital and traditional elements interact dynamically rather than displace one another.

Three broader conclusions follow. First, digital Bharatanatyam represents not a rupture from tradition but a hybrid configuration that extends the art form's reach while raising significant questions about embodiment, lineage, and cultural authenticity. Second, the analytical vocabulary appropriate to this transformed practice draws on multiple theoretical traditions and requires sustained interdisciplinary engagement. Third, supportive institutional, pedagogical, and critical responses are needed to ensure that digital developments enrich rather than impoverish the long-term cultural sustainability of the art form.

Several directions for future research are warranted. Ethnographic studies of online Bharatanatyam classrooms would deepen understanding of pedagogical adaptation. Audience studies of digital Bharatanatyam consumption would illuminate the formation of new viewing publics. Comparative work across Indian classical dance traditions, building on broader surveys by Khokar and Vatsyayan would clarify what is distinctive to Bharatanatyam and what is shared with Kathak, Odissi, Kuchipudi, Mohiniyattam, Manipuri, Kathakali, and Sattriya.[5,3] Studies engaging diasporic Bharatanatyam communities, the experiences of female practitioners and the perspectives of younger dancers shaping the future of the form would each address important gaps.[19,24] By advancing such an agenda, performing arts scholarship can contribute meaningfully to understanding one of the most significant transformations in Indian classical dance in the present era.

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Maritime Trade in Ancient Tamilakam: Archaeological Evidence from the Sangam Age Indo-Roman Commerce

Suja Mol Joseph

Assistant Professor, Department of History, Nirmalagiri College (Autonomous), Kuthuparamba, Kannur, India.

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Abstract

Ancient Tamilakam, the southernmost peninsular region of the Indian subcontinent during the Sangam Age, occupied a strategic position in the maritime trade networks linking the Mediterranean world, the Red Sea, the Persian Gulf, the eastern coast of Africa, and Southeast Asia. Archaeological investigations over the past century, supplemented by literary and epigraphic evidence from Tamil Sangam poetry, Greco-Roman geographical texts, and Tamil-Brahmi inscriptions, have produced a rich understanding of the Indo-Roman commerce that flourished during the early centuries of the Common Era. This article examines the maritime trade of ancient Tamilakam through an archaeological perspective, focusing on excavated sites, material culture, and the wider trade networks documented through diverse sources of evidence. Drawing on a critical literature review methodology, the study analyses peer-reviewed scholarship and archaeological reports published primarily between 2010 and 2025, supplemented by foundational earlier works. The analysis identifies four dimensions of the Tamilakam maritime trade system: the major port sites and their archaeological signatures, including Arikamedu, Pattanam, Korkai, Alagankulam, and Kaveripoompattinam; the artefact assemblages indicating long-distance exchange, including Roman amphorae, Mediterranean ceramics, beads, glass, and metalwork; the literary and epigraphic evidence corroborating archaeological findings; and the broader political economy and inter-regional connections of the Sangam world. The study draws on the work of Indian archaeologists including K. V. Soundara Rajan, Y. Subbarayalu, K. Rajan, and P. J. Cherian, alongside international scholars including Vimala Begley, Roberta Tomber, and others. The article concludes with implications for archaeological research, museum interpretation, and Indian historiography.

Keywords: Tamilakam, Sangam Age, Indo-Roman Trade, Maritime Archaeology, Arikamedu, Pattanam, Periplus, Ancient Commerce

INTRODUCTION

The southern tip of the Indian peninsula has been an important node in long-distance maritime exchange for over two millennia. During the period commonly designated as the Sangam Age, broadly the centuries between approximately 300 BCE and 300 CE, ancient Tamilakam, encompassing the territories of present-day Tamil Nadu, Kerala, and southern Karnataka and Andhra Pradesh, was the southern terminus of an extensive trade system that connected the Mediterranean world to the Indian Ocean and beyond.[1] Greco-Roman authors including the anonymous author of the Periplus Maris Erythraei, Ptolemy in his Geography, and Pliny the Elder in his Naturalis Historia documented the ports, products, and prices of this commerce.[2] Tamil Sangam poetry, including the Akananuru, Purananuru,

Pattuppattu, and other anthologies, preserves vivid imagery of port cities, foreign merchants, and the cosmopolitan life of coastal Tamilakam.[3] Tamil-Brahmi inscriptions, dated by paleographic and stratigraphic evidence to the same broad period, provide further corroborative evidence of trade-related activities.[4]

Archaeological investigation of this trade system began in earnest in the colonial period, with notable early excavations including Sir Mortimer Wheeler's 1945 work at Arikamedu near Puducherry, which established the Indo-Roman dating framework for South Indian coastal trade.[5] Subsequent decades have witnessed extensive archaeological investigation across the Tamilakam coastal landscape.[6] The work of Indian archaeologists at multiple institutions, including the Archaeological Survey of India, the Tamil Nadu State Department of Archaeology, the Kerala Council for Historical Research, the French School at Pondicherry, the Madurai Kamaraj University, the University of Madras, the University of Kerala, and several others, has substantially expanded the empirical base.[7] Key sites including Arikamedu, Pattanam, Korkai, Alagankulam, Kaveripoompattinam, and others have produced rich artefact assemblages including Roman amphorae fragments, Mediterranean fine wares, glass, metal objects, beads, and indigenous pottery types that together document an active and sustained trade system.[8]

Recent decades have produced substantial new evidence and significant reinterpretation. The Pattanam excavations in central Kerala, conducted under the leadership of the Kerala Council for Historical Research, have produced a particularly rich artefact assemblage that has reshaped understanding of the Indo-Roman trade.[9] The continuing investigations at Keeladi in Tamil Nadu, while focused on a more inland Sangam-period urban site, contribute substantively to understanding the broader Tamilakam economic and cultural landscape.[10] Reanalyses of older excavated material with newer scientific methods, including provenance analyses of ceramics and metalwork, have refined trade flow reconstructions.[11] The integration of literary, epigraphic, and archaeological evidence has continued to mature.

Against this backdrop, the present article asks: what does archaeological evidence reveal about maritime trade in ancient Tamilakam, and how does this evidence integrate with literary and epigraphic sources to illuminate the Sangam-Age Indo-Roman commerce? Three subsidiary questions structure the inquiry.

- First, what are the major port sites and their archaeological signatures?
- Second, what artefact assemblages and material culture document the long-distance exchange?
- Third, how do archaeological findings integrate with literary and epigraphic sources, and what are the broader implications for understanding Sangam-Age political economy and connectivity?

The article makes three contributions: it synthesizes archaeological scholarship on Tamilakam maritime trade with attention to recent findings; it identifies four interlocking dimensions of the trade system; and it articulates implications for archaeological research, museum interpretation, and Indian historiography.

LITERATURE REVIEW

Foundational Archaeological Works

The foundational archaeological works on Tamilakam maritime trade extend back over a century. Early excavations at Arikamedu by French and British archaeologists in the 1930s and the systematic 1945 campaign led by Sir Mortimer Wheeler established the basic framework of Indo-Roman trade dating and material culture.[12] Wheeler's identification of imported Mediterranean amphorae, Italian fine wares including Arretine ware, glass vessels, and other Roman material at Arikamedu provided dramatic evidence of long-distance trade and stimulated subsequent generations of investigation.[13] The decades following Wheeler's work saw expanded investigation at multiple sites, with significant contributions by Indian archaeologists including K. V. Soundara Rajan, K. R. Srinivasan, K. K. Pillay, R. Champakalakshmi, and many others.[14]

Recent Excavations and Material Analysis

Recent decades have produced substantial new evidence. The Pattanam excavations in

Ernakulam district, Kerala, conducted under the directorship of P. J. Cherian and the Kerala Council for Historical Research between 2007 and 2015, produced one of the richest Indo-Roman artefact assemblages excavated in India, including thousands of Roman amphorae sherds, Mediterranean fine wares, glass and bead assemblages, and substantial indigenous material culture.[15] Reinvestigations at Arikamedu, including the work of Vimala Begley and her collaborators, refined the dating and stratigraphy of the site.[16] Excavations at Korkai in Thoothukudi district, the legendary Pandyan port mentioned in Sangam literature, have produced evidence of pearl industry and maritime activity. Investigations at Alagankulam in Ramanathapuram district, near the mouth of the Vaigai River, have produced ceramic and other evidence of long-distance trade. Continuing work at Keeladi by the Tamil Nadu State Department of Archaeology and the Archaeological Survey of India has produced material that, while not coastal, contributes to understanding the broader urban and economic landscape of Sangam Tamilakam.[17]

Greco-Roman Textual Sources

Greco-Roman texts provide indispensable complementary evidence for understanding ancient Tamilakam trade. The Periplus Maris Erythraei, an anonymous merchant's handbook of the mid-first century CE, describes ports along the Indian west and east coasts and the goods exchanged.[18] Ptolemy's Geography from the second century CE provides a more systematic geographical framework. Pliny the Elder, writing in the first century CE, comments on the volume of trade and the precious goods imported from India, lamenting the drain of Roman currency to the East.[19] Strabo, Periplus author, Ptolemy, and Pliny each provide distinctive vantages on the trade. The interpretive tradition handling these sources has been substantially developed in scholarship by Lionel Casson, J. Innes Miller, Federico De Romanis, and others, with continuing attention to the relationship between textual descriptions and archaeological evidence.[20]

Tamil Literary and Epigraphic Evidence

Tamil Sangam literature and Tamil-Brahmi inscriptions provide crucial indigenous perspectives on Tamilakam maritime trade.[21] Sangam poetry references major ports including Muziris (Muciri or Muciripattinam in the texts), Korkai, Kaveripoompattinam (Pumpuhar), Tondi, Marakkanam, Kaveriyumpattinam, and others. Poems describe the cosmopolitan character of port cities, the presence of Yavana (Greco-Roman) merchants, the variety of imported goods, and the indigenous products exchanged. Tamil-Brahmi inscriptions on cave walls, on potsherds (including the famous Pattanam graffiti), on stone slabs, and on coins provide further evidence of literacy, commercial activity, and the social organization of trade.[22] The work of Iravatham Mahadevan, Y. Subbarayalu, K. Rajan, R. Champakalakshmi, and others has been central to developing this evidence base.[23]

Research Gap

Despite the rich existing scholarship, integrative analyses that synthesize archaeological, literary, and epigraphic evidence within a single coherent framework remain comparatively rare. The integration of recent excavation findings with older syntheses, attention to less-studied port sites alongside major centres, and the broader political-economy framing of Sangam-Age commerce continue to provide productive areas for further work. The present article seeks to contribute to addressing these gaps.

METHODS

This study employs a critical literature review methodology with thematic synthesis, suitable for engaging an interdisciplinary historical and archaeological topic. The review proceeded through four stages. In the first stage, a structured search was conducted in JSTOR, Scopus, Web of Science, the L'Année Philologique, the Indian Citation Index, the Archaeological Survey of India publications database, and Google Scholar. Search terms combined Tamilakam, Sangam, Indo-Roman trade, Periplus, Arikamedu, Pattanam, Korkai, Kaveripoompattinam, Pumpuhar, Muziris, Yavana, Tamil-Brahmi, and related geographical and chronological terms. The window covered January 2010 to August 2025, with substantial earlier scholarship retained for foundational reference.

In the second stage, inclusion criteria specified peer-reviewed empirical archaeological publications, scholarly historical and philological works, and syntheses engaging with Tamilakam

maritime trade. Reports from the Archaeological Survey of India, the Tamil Nadu State Department of Archaeology, the Kerala Council for Historical Research, the French Institute at Pondicherry, and other institutional excavation reports were also reviewed. Exclusion criteria filtered out exclusively popular or journalistic treatments without scholarly framing, and non-peer-reviewed materials except for authoritative excavation reports. After title, abstract, and full-text screening, sixty-eight publications were retained.

In the third stage, supplementary materials were drawn from publicly available primary source translations including the Periplus Maris Erythraei in the editions of Wilfred Schoff and Lionel Casson, Pliny's Naturalis Historia, Ptolemy's Geography, and selected Tamil Sangam poems in scholarly translation. In the fourth stage, thematic synthesis generated four interlocking dimensions of the Tamilakam maritime trade system that structure the findings reported below. As a literature-based study using publicly available secondary materials, the research did not require formal ethics approval.

RESULTS

Major Port Sites and Their Archaeological Signatures

The first dimension concerns the major port sites of ancient Tamilakam and their archaeological signatures. Arikamedu, on the east coast of present-day Puducherry, has been the most extensively investigated of these sites since the 1930s and 1940s.[24] Excavations have revealed a substantial settlement with evidence of bead manufacturing, dyeing operations, and the sustained importation of Mediterranean ceramics including Italian sigillata, amphorae from various Mediterranean regions, glass vessels, and other foreign material. Pattanam, in central Kerala, has emerged as a particularly important site through the systematic excavations from 2007 to 2015, producing rich Roman amphorae assemblages alongside extensive indigenous material culture, including Tamil-Brahmi inscribed potsherds.[25] Pattanam is widely identified with the Muziris of the Periplus, although alternative identifications have been proposed.[26]

Korkai, the legendary Pandyan port on the Tamil Nadu southeast coast, has produced evidence of pearl industry activity consistent with Sangam literary references and Greco-Roman descriptions of pearl exports.[27] Alagankulam, near the Vaigai mouth in Ramanathapuram district, has yielded ceramic and other evidence of trade activity, including imported Mediterranean and indigenous pottery. Kaveripoompattinam (Pumpuhar) at the Kaveri delta in Tamil Nadu, the legendary port of the Chola kingdom celebrated in Tamil literary tradition including the Cilappatikaram, has been investigated through both terrestrial and underwater archaeology, with results indicating substantial coastal urban activity.[28] Other important sites include Marakkanam on the Tamil Nadu coast, Tondi (probably modern Adirampattinam region), the inland trading centre of Karur,[29] and various smaller coastal settlements that participated in the broader trade network.

Artefact Assemblages and Long-Distance Exchange

The second dimension concerns the artefact assemblages that document long-distance exchange. Roman amphorae, large ceramic containers used to transport wine, olive oil, and garum (a fish sauce), are perhaps the most diagnostic foreign artefact category at Tamilakam coastal sites. Studies of amphorae fragments by Roberta Tomber and others have refined the typology and chronology of Mediterranean shipments to South India, identifying amphorae from Italy, the Aegean, Egypt, and other Mediterranean regions.[30] Italian Arretine ware, Eastern Sigillata, and Roman glass vessels constitute additional foreign ceramic and glass classes.[31] Roman coins of varying denominations, including silver denarii and gold aurei, have been recovered at multiple sites and analysed for chronological and economic implications by numismatic specialists.[32]

Indigenous artefacts associated with the trade include the Northern Black Polished Ware (NBPW), Rouletted Ware, and various distinctive South Indian ceramics. Bead manufacturing, attested most clearly at Arikamedu, produced glass, semi-precious stone, and other beads that traveled in both directions of the trade network.[33] Metalwork including bronze and copper objects, lamps of distinctive Roman and indigenous forms, ironwork, and gold and silver ornaments contribute additional material evidence. Textile evidence is more elusive due to preservation conditions, but textile-related implements and documentary references support the importance of cotton and other textile exports. Spices, particularly black pepper, are described as major Tamilakam exports in Greco-Roman texts but

leave more limited direct archaeological signatures, although evidence of pepper has been recovered in shipwreck contexts and at Mediterranean entrepôts.[34]

Literary and Epigraphic Corroboration

The third dimension concerns the integration of literary and epigraphic evidence with archaeological findings. The Periplus Maris Erythraei describes a system of ports, sailing seasons (the predictable monsoon winds enabling the so-called Hippalus route), products, and prices that aligns substantially with archaeological evidence.[35] The text mentions Muziris, Nelcynda, and other ports on the Tamilakam coast, with descriptions of imports including wine, copper, lead, glass, coral, gold and silver coin, and exports including pepper, malabathrum, pearls, ivory, fine textiles, and tortoise shell.[36] Pliny's lament about the Roman currency drain to India is paralleled by Roman coin hoards in South India.[37] Ptolemy's geographical descriptions, while sometimes diverging from precise location identification, provide a coherent framework for the major ports.

Tamil-Brahmi inscriptions corroborate the literary evidence in important ways. The Pattanam graffiti, including potsherds inscribed with names and references suggesting commercial activity, provides direct evidence of literacy and identification at the port.[38] Tamil-Brahmi inscriptions in cave shelters along trade routes, in coin contexts, and at urban sites further extend the evidence base.[39] The Yavanas mentioned in Sangam poetry, identified as foreign (Greco-Roman) merchants present in Tamilakam ports, are consistent with the diverse foreign material recovered archaeologically. The integration of archaeological, literary, and epigraphic evidence produces a coherent picture in broad outline, while specific identifications and chronological details continue to be refined through ongoing scholarship.

Political Economy and Inter-Regional Connections

The fourth dimension concerns the broader political economy and inter-regional connections of the Sangam world. The Tamilakam ports operated within a political landscape dominated by the Chera, Chola, and Pandya kingdoms, with smaller chieftaincies and tribal polities also exerting regional influence.[40] The maritime trade was an important component of state revenue, supplied luxury goods to ruling elites, and supported urbanization in coastal centres. The trade also linked Tamilakam to the broader Indian Ocean world, including the western coast of the Indian subcontinent (with Bharukaccha, modern Bharuch, as a major node), Sri Lanka, the Maldives, the East African coast, the Persian Gulf, the Red Sea, and Southeast Asia.[41]

The Indo-Roman trade was complemented by Indo-Southeast Asian exchange networks, evidence of which has been recovered both in Tamilakam contexts and at sites across Southeast Asia, supporting cross-regional analyses by scholars including Ian Glover, Berenice Bellina, and others.[42] Indian merchant communities established presence in the Persian Gulf, the Red Sea, and Southeast Asian sites, while foreign merchant communities, particularly Yavana merchants, were present in Tamilakam ports.[43] The political economy of the Sangam Age was therefore not a closed regional system but an active node within a hemispheric exchange network whose archaeological, literary, and epigraphic traces continue to be productively investigated.[44]

DISCUSSION

The findings carry several important implications. Theoretically, they support an integrative archaeological framework that combines material culture analysis, literary evidence, epigraphic data, and political-economy interpretation rather than treating these as separate evidentiary streams. The four dimensions identified, port sites and their archaeological signatures, artefact assemblages and exchange evidence, literary and epigraphic corroboration, and broader political economy and inter-regional connections, are mutually reinforcing rather than separable. Comprehensive understanding of any one dimension requires engagement with the others.

For archaeological research, the findings suggest several priorities. Continued excavation, with attention to less-studied port sites and to the inland hinterlands that supplied trade goods and absorbed imports, would expand the empirical base. Provenance studies of imported ceramics, metalwork, and other materials using modern scientific methods including isotopic analysis, neutron activation analysis, and lead isotope studies would refine trade flow reconstructions. Underwater archaeology along the

Tamilakam coast and adjacent waters would extend the evidence base into shipwreck contexts that are likely to preserve material rarely recovered on land sites. Reanalysis of existing collections held in museum and institutional repositories, using techniques unavailable at the time of original excavation, could yield substantial new insights.

For museum interpretation, the findings emphasize the importance of integrated presentations that combine archaeological material with literary, epigraphic, and broader contextual sources. Museum displays of Tamilakam maritime trade material at the Government Museum in Chennai, the Pondicherry Museum, the Pattanam Excavation Centre, the Indian Museum in Kolkata, and other institutions can engage public audiences with the cosmopolitan and economically dynamic character of the Sangam-Age coast. Digital and virtual reconstructions of port sites, trade networks, and material culture offer further interpretive possibilities.

For Indian historiography, the findings support continued attention to the long durations of Indian Ocean exchange and the deep history of Indian connectivity with the wider world. The Sangam-Age trade demonstrates that South Indian engagement with Mediterranean, West Asian, African, and Southeast Asian commercial networks substantially predates the colonial period and constitutes a foundational dimension of Indian historical experience. Integration of Tamilakam trade evidence into broader Indian history teaching, both at school and university levels, would address a frequent gap in narrative coverage that has historically focused more on northern Indian developments.

Several limitations of the present analysis warrant acknowledgment. As a literature-based study, the analysis depends on the quality and coverage of available scholarship, which remains uneven across port sites and archaeological topics. Variation in excavation methodology, dating frameworks, and reporting standards across decades complicates direct comparison. Ongoing investigations including new excavations and reanalyses mean that some findings will require updating as evidence accumulates. The voices of indigenous and descendant communities, while reflected in some recent scholarship, are not fully represented through secondary sources alone.

CONCLUSION

This article has examined the maritime trade of ancient Tamilakam through an archaeological perspective, with attention to the Sangam-Age Indo-Roman commerce and its broader hemispheric connections. Drawing on archaeological reports, literary translations, epigraphic evidence, and synthetic scholarship, the analysis identified four interlocking dimensions: the major port sites and their archaeological signatures including Arikamedu, Pattanam, Korkai, Alagankulam, and Kaveripoompattinam; the artefact assemblages documenting long-distance exchange including Roman amphorae, fine wares, glass, beads, and metalwork; the integration of archaeological evidence with literary and epigraphic sources; and the broader political economy and inter-regional connections of the Sangam world.

Three broader conclusions follow. First, ancient Tamilakam was a substantively cosmopolitan and economically dynamic region that operated as an active node in a hemispheric maritime exchange network during the Sangam Age. Second, robust understanding of this trade requires the integration of archaeological, literary, and epigraphic evidence within a coherent interpretive framework, drawing on the deep traditions of Indian and international scholarship. Third, continued investigation, both through new excavation and through the reanalysis of existing material with modern methods, promises to refine understanding of one of the most important early phases of Indian maritime history.

Several directions for future research are warranted. Continued excavation and survey at port sites and in their hinterlands would expand the empirical base. Scientific provenance analyses of imported and indigenous materials would refine trade flow reconstructions. Underwater archaeology along the Tamilakam coast offers significant potential for adding shipwreck and submerged settlement evidence. Comparative studies linking Tamilakam findings with contemporary sites in Sri Lanka, Southeast Asia, the Red Sea, and East Africa would clarify the broader hemispheric context. Integration of recent findings into school and university history curricula would support better public understanding of this important period. By advancing such an agenda, archaeological scholarship can continue its productive contribution to one of the most exciting frontiers of early Indian history.

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Madhubani Art and Cultural Sustainability: From Folk Tradition to Global Marketplace

Manoj T R

Associate Professor, Department of History, Milad-E-Sherief Memorial College, Kayamkulam, India

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Abstract

Madhubani painting, also known as Mithila art, is one of the most distinctive folk art traditions of India. Originating in the Mithila region of present-day Bihar and parts of southern Nepal, the form has historically been practiced by women on the walls and floors of homes during weddings and religious occasions. Over the past five decades, Madhubani has undergone a remarkable transformation from a domestic ritual practice into a globally circulating commodity, gaining a Geographical Indication tag in 2007 and finding markets in galleries, craft fairs, and online platforms across the world. This article examines Madhubani art and the question of cultural sustainability through a visual arts and cultural studies perspective. Drawing on a critical literature review methodology, the study analyses peer-reviewed scholarship and policy documents published between 2010 and 2025. The analysis identifies four interlocking dimensions of contemporary Madhubani: the commodification and commercialization of the art form; the gendered economies of artistic production; the negotiation of authenticity, innovation, and tradition; and the digital and global circulation of Madhubani imagery. Findings indicate that Madhubani occupies a complex position between cultural preservation and market-driven transformation, with significant implications for women artists, regional development, and Indian cultural policy. The article concludes with implications for visual arts research, cultural sustainability, and the design of policy interventions that support both artistic livelihoods and the integrity of Mithila traditions.

Keywords: Madhubani art, Mithila Painting, Folk Art, Visual Arts, Cultural Sustainability, Women Artists, Geographical Indication, Indian Craft

INTRODUCTION

Madhubani painting, named after the town of Madhubani in northern Bihar but more accurately described as the visual tradition of the broader Mithila region, is among the most internationally recognized folk art forms of India.[1] Characterized by its distinctive use of natural pigments, intricate linework, mythological and ritual subject matter, and the absence of empty space within the composition, Madhubani has historically been an art of domestic ritual painted by women on the walls of mud houses during weddings, festivals, and religious occasions.[2] The form encompasses several stylistic schools including the Bharni style associated with upper-caste women, the Kachni style with its detailed line work, the Tantric style focused on religious symbolism, the Godhana style associated with Dalit communities, and the Kohbar tradition specifically tied to wedding chambers.[3]

The trajectory of Madhubani in the past half century has been remarkable. The 1966 Bihar drought, which prompted government and non-governmental intervention to support rural livelihoods, played a significant role in the migration of Madhubani from wall painting to paper, canvas, and other portable supports that could be sold in urban and international markets.[4] Subsequent decades witnessed the form's gradual entry into national exhibitions, international galleries, and global commercial circuits.[5] The Government of India recognized Madhubani painting with a Geographical Indication tag in 2007,[6] and the form has been featured prominently in cultural diplomacy, tourism promotion, and craft revival initiatives. Several Madhubani artists have received Padma awards and international recognition.

Yet this transformation has produced a complex set of tensions. The shift from ritual practice to commercial production has reshaped the relationship between artists, their work, and their communities. The participation of male artists, the entry of organized commercial intermediaries, the standardization of motifs to satisfy market expectations, and the digital circulation of Madhubani imagery have all generated debates about authenticity, fair compensation, and the cultural sustainability of the tradition. The voices of women artists, who historically were and largely remain the form's primary practitioners, have not always been adequately represented in policy and market arrangements that shape their lives.

Against this backdrop, the present article asks: how does Madhubani art navigate the relationship between folk tradition and global marketplace, and what are the implications for cultural sustainability? Three subsidiary questions structure the inquiry:

- First, how have commercialization and commodification transformed Madhubani practice?
- Second, what gendered economies of production characterize the contemporary Madhubani ecosystem?
- Third, how is authenticity negotiated, and what role does digital circulation play in the global trajectory of the form?

The article makes three contributions: it synthesizes scholarship on Madhubani through a cultural sustainability lens; it identifies four interlocking dimensions of the contemporary Madhubani landscape; and it articulates implications for visual arts scholarship, cultural policy, and artist livelihoods.

LITERATURE REVIEW

Madhubani: Historical and Cultural Foundations

Scholarly engagement with Madhubani painting has grown substantially since the 1970s, when foundational works began to document the form's ritual contexts, stylistic schools, and emerging commercial trajectory.[7] Yves Véquaud's early work introduced Madhubani to international audiences,[8] while subsequent scholars including Carolyn Brown Heinz, Kailash Kumar Mishra, and David Szanton have produced detailed studies of the form's caste, gender, and regional dimensions.[9] Heinz's long-term research has been particularly important in tracing the lives and work of individual artists,[10] while Szanton's collaborative projects have foregrounded the perspectives of practitioners themselves.[11] Earlier biographical work, such as Jain's study of Ganga Devi, has further illuminated the creative trajectories of leading Mithila artists.[12]

Folk Art, Commodification, and Cultural Sustainability

Theoretical literature on the commodification of folk and indigenous arts provides useful frameworks for analysing Madhubani's contemporary trajectory. Scholars including Jonathan Hay, Charlene Spretnak, and Kavita Singh have examined how folk and indigenous traditions are reshaped through their entry into global art markets.[13] The cultural sustainability literature, drawing on the work of UNESCO and scholars including J. Mark Schuster and David Throsby, attends to the conditions under which traditional cultural forms can endure across generations while engaging contemporary economic and social conditions.[14] Geographical Indication frameworks, theorized in the work of Dwijen Rangnekar and others, offer specific legal and economic instruments for protecting place-based traditional knowledge in global markets.[15]

Gender and Artistic Labour in Indian Folk Art

Gender is central to the analysis of Madhubani, given that the form has historically been a

women's art passed across maternal lines. Feminist scholarship on Indian folk and craft traditions, including work by Tirthankar Roy, Soumhya Venkatesan, and Catherine Becker, has examined how gendered labour is valued, compensated, and represented within craft economies.[16] The literature has particularly attended to the gap between the cultural visibility of women artists and the economic structures that often allocate larger shares of value to male intermediaries, gallery owners, and corporate buyers.[17]

Digital Circulation and Global Markets

A growing body of work examines the digital circulation of Indian folk and craft traditions.[18] Online marketplaces, social media platforms, virtual galleries, and craft-focused e-commerce have transformed the visibility, accessibility, and market structure of Madhubani and comparable forms. While such circulation can expand market access for artists, it also raises questions about intermediation, intellectual property, and the relationship between digital images and embodied artistic practice.[19] The COVID-19 pandemic accelerated digital adoption in the craft sector, with implications that continue to unfold in the post-pandemic period.

Research Gap

Despite this expanding literature, several gaps remain. Integrative analysis of Madhubani that simultaneously engages historical, gendered, commercial, and digital dimensions is comparatively rare, with most scholarship focused on one or two of these strands. The cultural sustainability framing, with its attention to long-term continuity and adaptation, has not been systematically applied to Madhubani in the academic literature. The voices of women artists themselves are unevenly represented, with much of the formal literature mediated through ethnographic and curatorial perspectives. The present article seeks to contribute to addressing these gaps.

METHODS

This study employs a critical literature review methodology with thematic synthesis, suitable for integrating dispersed scholarship across visual arts, cultural studies, gender studies, and craft economics. The review proceeded through four stages. In the first stage, a structured search was conducted in JSTOR, Scopus, ProQuest, the Indian Citation Index, Project MUSE, and Google Scholar. Search terms combined Madhubani, Mithila painting, Indian folk art, Geographical Indication, women artists, craft economy, and cultural sustainability. The window was January 2010 to August 2025, with selected earlier sources retained for theoretical and historical grounding.

In the second stage, inclusion criteria specified peer-reviewed empirical, theoretical, or critical scholarship engaging with Madhubani or comparable Indian folk art traditions, supplemented by foundational works in folk art studies, cultural sustainability, and craft economics. Exclusion criteria filtered out exclusively descriptive or coffee-table treatments without scholarly framing, and non-peer-reviewed materials except for authoritative reports from cultural institutions. After title, abstract, and full-text screening, fifty-eight publications were retained.

In the third stage, supplementary contextual materials were drawn from publicly available sources including reports from the Ministry of Textiles, the Development Commissioner for Handicrafts, the All India Handicrafts Board, Sangeet Natak Akademi, the Crafts Council of India, and the registered Geographical Indication documentation. In the fourth stage, thematic synthesis generated four interlocking dimensions of contemporary Madhubani that structure the findings reported below. As a literature-based study using publicly available secondary materials, the research did not require formal ethics approval.

RESULTS

Commodification and the Reshaped Practice of Madhubani

The first dimension concerns the commodification of Madhubani and its consequences for artistic practice. The migration of Madhubani from walls and floors to paper, canvas, fabric, and an expanding range of decorative and utilitarian objects has fundamentally reshaped how the form is produced. Production for the market introduces considerations of standardization, replicability, quality control for buyer expectations, and adaptation to scales and supports that differ markedly from traditional ritual

contexts. Some artists have developed signature individual styles that command premium prices and gallery representation, while many others produce within wholesale supply chains that pay piece rates with limited recognition of individual authorship.

The implications for artistic practice are mixed. Commodification has enabled livelihoods that would have been unavailable in the ritual-only economy and has supported the reproduction of skill across generations through workshops, training programmes, and master-apprentice relationships. At the same time, market pressures can encourage repetition over experimentation, the use of synthetic colours that travel well rather than traditional natural pigments, and the simplification of compositions for cost-efficient production. The commercial imperatives of replicability sometimes sit in tension with the ritual imperatives of singularity, devotion, and embeddedness in particular life events.

The Gendered Economies of Madhubani Production

The second dimension concerns the gendered economies that structure Madhubani production. Women remain the predominant producers of Madhubani painting, particularly in village-level cooperatives and household-based production arrangements. Yet the value chains through which Madhubani reaches buyers, both within India and internationally, often include male intermediaries, traders, gallery owners, and corporate buyers who capture significant portions of the final price. Government schemes, NGO interventions, and Geographical Indication mechanisms have sought to redress these imbalances, with mixed results. Successful artists' cooperatives have demonstrated the possibility of more equitable distribution, but they remain unevenly distributed across the Mithila region.

Several specific challenges affect women artists particularly. The pressures of household and care work limit the time available for skilled artistic production. Limited mobility and connectivity for many women constrains direct engagement with markets and buyers. Educational and language barriers can complicate engagement with intellectual property protection, contract negotiation, and digital marketing. Despite these challenges, women Madhubani artists, including those who have achieved national and international recognition such as the late Sita Devi, Ganga Devi,[20] Mahasundari Devi, and Bua Devi, have demonstrated remarkable creative innovation and capacity for sustained artistic careers.[21]

Authenticity, Innovation, and the Negotiation of Tradition

The third dimension concerns the negotiation of authenticity, innovation, and tradition within contemporary Madhubani. The form has incorporated significant innovations over the past half century, including the move to paper supports, the use of new pigments, the engagement with contemporary social themes such as women's rights, environmental concerns, and political commentary, and the development of individual signature styles. Some of these innovations have been celebrated as evidence of the tradition's vitality, while others have generated debate about the boundaries of authenticity.

The Geographical Indication framework provides one institutional anchor for authenticity, defining Madhubani in terms of geographical origin in the Mithila region and certain traditional features.[22] Yet the framework itself necessarily simplifies what is, in practice, a complex and evolving set of stylistic schools, regional variations, and individual artistic voices.[23] Scholarly and curatorial discussions of authenticity in folk art emphasize the importance of distinguishing between living tradition, which incorporates innovation while maintaining cultural continuity, and frozen tradition, which can produce a museum-like preservation that may not serve the long-term sustainability of the form.[24]

Digital Circulation and the Global Madhubani Image

The fourth dimension concerns the digital circulation of Madhubani imagery and its consequences for the form's global trajectory. Online platforms including dedicated craft marketplaces, general e-commerce sites, social media, and image-sharing services have made Madhubani widely visible to international audiences.[25] This visibility supports market expansion and cultural exchange while also raising significant concerns. Digital images of Madhubani works circulate widely, sometimes without attribution to the original artist, and motifs are frequently appropriated for use on commercial products with limited or no benefit-sharing with the artistic community.[26]

Intellectual property protection in the visual arts faces distinctive challenges, particularly for traditional forms where individual authorship operates alongside collective cultural inheritance.[27] The Geographical Indication framework provides limited protection for the Madhubani name and origin, but it does not extend to the protection of specific motifs, compositions, or the work of individual artists in the way that copyright or design rights might.[28] Digital documentation projects, including those led by Indian and international cultural institutions, have begun to build accessible visual archives that may support both research and artist visibility, though questions of consent, benefit-sharing, and cultural protocol require ongoing attention.[29]

DISCUSSION

The findings carry several important implications. Theoretically, they support an integrative analysis of folk art that combines visual arts scholarship, cultural sustainability frameworks, gender economic analysis, and digital cultural studies. The four dimensions identified are interlocking rather than separate. Commodification operates within gendered structures; authenticity debates are shaped by both market and digital pressures; and digital circulation reshapes the economics and aesthetics of the tradition simultaneously.

For cultural sustainability, the findings suggest that Madhubani's long-term continuity depends on conditions that go beyond market expansion alone. Sustainable practice requires investment in skill transmission across generations, mechanisms that ensure artists receive a meaningful share of the value their work generates, the protection of stylistic and regional diversity within the broader tradition, and the support of innovation alongside continuity. Cooperative production models, fair trade craft frameworks, and direct artist-to-market arrangements supported by digital tools all have roles to play, although none constitutes a complete solution on its own.[30]

For policy, the findings emphasize the importance of integrated approaches across cultural, commerce, and gender frameworks. The Ministry of Textiles, the Ministry of Culture, the Ministry of Women and Child Development, and state-level cultural and craft agencies all have relevant mandates that benefit from coordination. Specific policy directions include strengthening artist registration and intellectual property literacy, supporting women-led cooperatives with credit and infrastructure, expanding training programmes in business, digital marketing, and contract literacy, and ensuring that GI protection is operationally meaningful rather than primarily symbolic.

For visual arts scholarship, the findings highlight the importance of approaches that combine art-historical, ethnographic, gender-sensitive, and digital-aware methodologies.[31] Comparative work between Madhubani and other Indian folk art traditions including Warli, Pattachitra, Gond, Kalighat, Phad, and Kalamkari would clarify shared dynamics and distinctive features.[32] Engagement with practitioner voices, ideally through participatory research approaches, would address persistent gaps in how knowledge about folk art is produced and circulated. Studies of how Madhubani is represented in museums, gallery spaces, and educational curricula would illuminate the form's broader cultural footprint.[33]

Several limitations of the present analysis warrant acknowledgment. As a literature-based study, it depends on the quality and coverage of available scholarship, which remains uneven across stylistic schools, generational cohorts, and Mithila subregions. The voices of women artists themselves are mediated through researcher framings, and primary participatory research is essential to enrich the analytical picture. The pace of digital and market change means that some findings will require updating as conditions evolve.

CONCLUSION

This article has examined Madhubani art and the question of cultural sustainability through a visual arts perspective. Drawing on folk art studies, cultural sustainability frameworks, feminist craft economics, and digital cultural studies, the analysis identified four interlocking dimensions: commodification and the reshaped practice of Madhubani; the gendered economies of production; the negotiation of authenticity, innovation, and tradition; and digital circulation and the global Madhubani image. Together these dimensions describe a tradition in active transformation, where market expansion, gendered livelihoods, contested authenticity claims, and digital circulation interact in complex ways.

Three broader conclusions follow. First, Madhubani exemplifies the broader challenges and opportunities facing Indian folk art traditions in the contemporary era. Its experience offers insights for the analysis of comparable traditions and for the design of cultural policy more broadly. Second, the question of cultural sustainability cannot be reduced to either market success or museum preservation. It requires attention to the conditions under which artistic skill is transmitted across generations, value is fairly distributed, and innovation is supported alongside continuity. Third, women artists are central to the past, present, and future of Madhubani, and their voices and economic interests must be central to any policy or institutional framework that seeks to support the tradition.

Several directions for future research are warranted. Ethnographic studies grounded in long-term engagement with Mithila artistic communities would enrich the empirical base. Quantitative studies of value distribution along Madhubani supply chains would provide evidence for policy reform. Comparative work across Indian folk art traditions and across global indigenous art markets would clarify what is distinctive about the Madhubani case. Studies on digital intellectual property in folk art contexts would address an emerging area of importance. Research engaging the perspectives of women artists themselves, including through participatory and oral history methods, is particularly important. By advancing such an agenda, visual arts scholarship can contribute meaningfully to the long-term cultural sustainability of one of India's most distinctive artistic traditions.

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Postcolonial Voices in Contemporary Indian English Poetry: Identity, Diaspora, and Literary Innovation

Rini Joy

Research Scholar, Sree Shankaracharya University of Sanskrit, Kalady, India.

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Abstract

Indian English poetry has undergone significant transformation in the postcolonial era, evolving from the foundational voices of the post-independence generation to a richly heterogeneous contemporary scene shaped by diaspora, gender, caste, regional rootedness, and the affordances of digital publishing. This article examines postcolonial voices in contemporary Indian English poetry, focusing on how identity, diaspora, and literary innovation intersect in poetic production from the late twentieth century to the present. Drawing on a critical literature review methodology, the study analyses peer-reviewed scholarship and curated literary criticism published between 2010 and 2025. The analysis identifies four interlocking dimensions of contemporary Indian English poetry: the negotiation of postcolonial identity across multiple axes including gender, caste, region, and sexuality; the diasporic imagination and the reconfiguration of homeland and elsewhere; formal and linguistic innovation including code-mixing, prose poetry, and experimental forms; and the digital and small-press publishing ecosystem that has expanded poetic visibility. The study draws on postcolonial theory including the work of Homi Bhabha, Gayatri Chakravorty Spivak, and Edward Said, alongside Indian literary scholarship by Bruce King, Eunice de Souza, Arvind Krishna Mehrotra, and others. Findings indicate that contemporary Indian English poetry is best understood not as a unified tradition but as a dynamic field of competing voices, each negotiating the inheritances of colonialism, the politics of identity, and the possibilities of literary innovation. The article concludes with implications for literary studies, anthology making, and the teaching of Indian English literature.

Keywords: Indian English Poetry, Postcolonial Literature, Diaspora, Identity, Literary Innovation, Contemporary Poetry, Dalit Poetry, Women Poets

INTRODUCTION

Indian English poetry occupies a complex and contested place within both Indian literary culture and the broader landscape of world literature in English.[1] From its early colonial-era beginnings through the foundational voices of the post-independence period to the rich heterogeneity of the contemporary scene, the tradition has continuously interrogated the conditions of writing in a language inherited through colonialism while addressing audiences spanning India and the wider Anglophone world.[2] The contemporary period, broadly understood from the late twentieth century to the present, has witnessed a flourishing of poetic voices marked by significant diversity in terms of identity, region, formal experimentation, and publishing context.

The post-independence canon of Indian English poetry, often associated with figures such as Nissim Ezekiel, Kamala Das, A. K. Ramanujan, Arvind Krishna Mehrotra, Dom Moraes, Keki Daruwalla, Adil Jussawalla, Eunice de Souza, and Jayanta Mahapatra, established a set of formal possibilities and thematic concerns that subsequent generations have inherited, extended, and at times decisively departed from.[3] Contemporary Indian English poetry includes the established voices of poets such as Tabish Khair, Vivek Narayanan, Arundhathi Subramaniam, Karthika Naïr, Tishani Doshi, Ranjit Hoskote, Mukta Sambrani, Meena Kandasamy, and many others writing from within India, alongside diasporic poets including Vijay Seshadri, Reetika Vazirani, Bhanu Kapil, Kazim Ali, and the late Agha Shahid Ali, whose work has profoundly shaped the global perception of Indian English poetic possibility.[4]

Several developments have reshaped the contemporary scene. The increasing visibility of women poets, Dalit poets, queer poets, and poets writing from regions and identities historically underrepresented in the canon has substantially expanded the field.[5] The digital era has introduced new publishing possibilities, including online journals, social media literary communities, poetry slams and spoken word, and small-press initiatives that have extended the pathways through which poetry reaches readers. The relationship between Indian English poetry and the rich traditions of poetry in regional Indian languages has also evolved, with translation, multilingual practice, and code-mixing playing increasingly significant roles.[6]

Against this backdrop, the present article asks: how do postcolonial voices in contemporary Indian English poetry negotiate identity, diaspora, and literary innovation, and what are the implications for literary studies and the broader cultural reception of the tradition? Three subsidiary questions structure the inquiry:

- First, how do contemporary poets navigate the multiple axes of postcolonial identity, including gender, caste, region, sexuality, and religion?
- Second, how does diasporic experience reshape poetic imagination and the relationship between homeland and elsewhere?
- Third, what formal and linguistic innovations characterize contemporary Indian English poetry, and how do digital and small-press publishing ecosystems contribute to its development?

The article makes three contributions: it synthesizes scholarship on contemporary Indian English poetry through a postcolonial lens; it identifies four interlocking dimensions of contemporary practice; and it articulates implications for literary studies, anthology making, and pedagogy.

LITERATURE REVIEW

Postcolonial Theoretical Foundations

Postcolonial literary theory has provided foundational resources for engaging Indian English poetry. Edward Said's analysis of Orientalism, Homi Bhabha's concepts of hybridity, mimicry, and the third space, and Gayatri Chakravorty Spivak's interrogation of the conditions under which the subaltern can speak together constitute a robust theoretical apparatus.[7] The Indian literary critical tradition has engaged these resources critically, with scholars including Aijaz Ahmad, Meenakshi Mukherjee, and Harish Trivedi raising important questions about the relationship between metropolitan postcolonial theory and the particular conditions of Indian literary production.[8] Subsequent generations of scholars have continued to develop these debates in ways that complicate any straightforward application of postcolonial theory to Indian English poetry.

Indian English Poetry: Critical and Anthological Foundations

The critical literature on Indian English poetry has developed substantially since the 1970s. Bruce King's extensive scholarship has provided essential historical mapping, while Eunice de Souza's anthologies and critical work have foregrounded the contributions of women poets and the politics of canon formation.[9] Arvind Krishna Mehrotra's critical essays and anthological work have shaped influential accounts of the tradition.[10] More recent scholarship by Rajeev Patke, Jeet Thayil, Anjum Hasan, and others has extended the critical conversation into the contemporary period, attending to new voices and emerging trends.[11] Anthological projects, including those edited by Mehrotra, de Souza,

Thayil, Daruwalla, Subramaniam, and others, have played significant roles in shaping how the tradition is conceived and transmitted.[12]

Diaspora, Identity, and Literary Imagination

The diasporic dimension of Indian English poetry has received sustained scholarly attention. Diasporic theory more broadly, drawing on the work of Stuart Hall, Avtar Brah, Vijay Mishra, and others, provides analytical resources for engaging the literary imagination of writers situated across multiple national and cultural contexts.[13] Studies of specific diasporic poets, including Agha Shahid Ali's rich engagement with Kashmir from his American context and Vijay Seshadri's work negotiating Indian and American literary traditions, have generated detailed critical engagements.[14] The conditions of diasporic publication, audience formation, and reception have also been examined, including the role of major American and British literary institutions in mediating Indian English poetry to international readers.[15]

Identity Politics and Marginalized Voices

A major development in contemporary scholarship has been the increasing engagement with poetry produced from positions of historical marginalization. Dalit literature, including Dalit poetry in English and translation from regional languages, has received growing critical attention, with scholars including Sharankumar Limbale, Eleanor Zelliot, and S. Anand engaging the political and aesthetic distinctiveness of the form.[16] Feminist scholarship on Indian English women poets, including work on Kamala Das, Eunice de Souza, Imtiaz Dharker, and contemporary voices, has examined the relationship between gendered experience and poetic form.[17] Queer Indian English poetry has begun to receive scholarly attention, although the literature remains comparatively thin. Region-specific studies have examined the contributions of poets writing from particular regional and linguistic contexts, including the Northeast, Kashmir, and South India.

Research Gap

Despite this expanding scholarship, several gaps remain. Integrative analyses that engage multiple identity axes simultaneously, rather than treating gender, caste, region, and diaspora in isolation, are comparatively rare. The digital and small-press publishing ecosystem, which has significantly reshaped the contemporary scene, has received limited systematic scholarly engagement compared to established literary press traditions. The relationship between contemporary Indian English poetry and parallel developments in regional language poetry merits further exploration, particularly in light of increasing translation and multilingual practice. The present article seeks to contribute to addressing these gaps.

METHODS

This study employs a critical literature review methodology with thematic synthesis, suitable for engaging the rich scholarly conversation around contemporary Indian English poetry. The review proceeded through four stages. In the first stage, a structured search was conducted in JSTOR, Project MUSE, the MLA International Bibliography, Scopus, the Indian Citation Index, and Google Scholar. Search terms combined Indian English poetry, contemporary Indian poetry, postcolonial poetry, Dalit poetry, diaspora, women poets, identity, and literary innovation. The window was January 2010 to August 2025, with selected earlier critical and theoretical works retained for grounding.

In the second stage, inclusion criteria specified peer-reviewed empirical, critical, or theoretical scholarship engaging with contemporary Indian English poetry, supplemented by foundational works in postcolonial theory and Indian literary criticism. Anthologies, edited critical volumes, and authoritative literary essays in established literary venues were also included. Exclusion criteria filtered out exclusively descriptive treatments without critical framing, journalistic profiles without scholarly engagement, and non-peer-reviewed materials except for established literary essays. After title, abstract, and full-text screening, sixty-five publications were retained.

In the third stage, supplementary materials were drawn from publicly available poetic texts, anthologies, and curated collections including Penguin Modern Classics editions, the Oxford India anthologies, and contemporary collections from independent presses. In the fourth stage, thematic

synthesis generated four interlocking dimensions of contemporary Indian English poetry that structure the findings reported below. As a literature-based study using publicly available secondary materials, the research did not require formal ethics approval. Standards of accurate citation, transparent reasoning, and balanced engagement with multiple critical traditions were maintained throughout.

RESULTS

Negotiating Postcolonial Identity Across Multiple Axes

The first dimension concerns the negotiation of postcolonial identity across multiple intersecting axes including gender, caste, region, sexuality, and religion. Contemporary Indian English poets have substantially extended the identity-political possibilities first opened by the post-independence generation. Women poets including Arundhathi Subramaniam, Tishani Doshi, Imtiaz Dharker, Karthika Naïr, Mukta Sambrani, Meena Alexander, and Sumana Roy have produced bodies of work that engage gendered experience, embodiment, mythology, and contemporary life with formal and thematic ambition.[18] Dalit poetry in English, by writers including Meena Kandasamy and the broader translated tradition of Dalit poetry from regional languages, has introduced critical interrogations of caste, language, and literary inheritance into the Anglophone scene.[19]

Regional and linguistic specificity also features prominently. Northeast Indian poetry, including the work of poets from Manipur, Assam, Nagaland, and other states, has begun to receive sustained critical attention for its engagement with conflict, ecology, and cultural specificity. Kashmiri Anglophone poetry, with the work of Agha Shahid Ali as a foundational reference and contemporary voices including Asiya Zahoor and others, engages the long history of Kashmir in distinctive ways. Queer Indian English poetry, including the work of Hoshang Merchant, Kazim Ali, and emerging younger voices, has expanded the affective and experiential range of the tradition. Religious specificity, including poetry written from minority religious positions, also contributes to the diversification of the field.

Diasporic Imagination and the Reconfiguration of Homeland

The second dimension concerns the diasporic imagination and the reconfiguration of homeland and elsewhere in poetic practice. Diasporic Indian English poets have produced significant bodies of work that engage the experience of displacement, the longing for homeland, and the layered identities of postcolonial mobility.[20] Agha Shahid Ali's ghazals and his elegiac engagement with Kashmir from American distance constitute one of the major poetic projects of the late twentieth century.[21] Vijay Seshadri's work, which earned the Pulitzer Prize for Poetry in 2014 with 3 Sections, exemplifies a different mode of diasporic engagement, in which Indian inheritance operates within an American literary frame. Younger diasporic voices including Bhanu Kapil and Kazim Ali have extended the diasporic poetic imagination further into experimental and identity-political territory.

The diasporic poetic imagination operates beyond a simple binary of home and abroad. Many diasporic poets engage multiple cultural inheritances, languages, and literary traditions in ways that produce hybrid and layered poetic voices. The relationship between diasporic and home-based poetry has also been productively complicated, with poets travelling, publishing, and presenting in multiple contexts. The international literary infrastructure, including major prizes, festivals, and educational institutions, plays significant roles in shaping the visibility of Indian English diasporic poetry.

Formal and Linguistic Innovation

The third dimension concerns formal and linguistic innovation in contemporary Indian English poetry. Contemporary poets have engaged a wide range of formal possibilities, including the ghazal as adapted in English by Agha Shahid Ali and others, the prose poem, the long poem, the sonnet sequence, the documentary poem, the multimedia poem, and various experimental forms.[22] Linguistic innovation has been particularly significant. Code-mixing, the strategic use of words and phrases from Indian languages within English poetry, has been theorized in scholarship by Bruce King, Tabish Khair, and others as a productive resource rather than a deviation from standard literary English.[23] Translation practice, including auto-translation by bilingual poets and translation from regional languages by poets and scholars, has expanded the linguistic ecology of Indian English poetry.[24]

Performance-oriented poetry, including spoken word and slam poetry traditions, has introduced different formal possibilities and audience relationships. The relationship between page-based and performance-based poetry remains productively contested. Visual and multimedia poetry, exploiting the affordances of digital publishing, represents another emerging area of formal experimentation. The aesthetic vocabulary appropriate to evaluating these innovations is still developing in critical scholarship, and there is significant room for sustained engagement.

Digital and Small-Press Publishing Ecosystems

The fourth dimension concerns the digital and small-press publishing ecosystems that have substantially expanded the contemporary Indian English poetry landscape. Independent presses including Speaking Tiger, Westland (now Pratilipi), Almost Island Books, Yoda Press, Sahitya Akademi's English imprint, Poetrywala, Copper Coin, and Hawakal have developed substantive poetry lists and brought a wider range of voices into print than the dominant trade presses can accommodate. Online literary journals, including The Wire's literary content, The Bombay Literary Magazine, Indian Cultural Forum, RIC Journal, and a wide range of others, have expanded the spaces in which new Indian English poetry circulates.

Social media platforms have introduced different modes of literary community, including poetry shared on Instagram, Twitter, and Facebook, sometimes in dialogue with traditional publication and sometimes operating in distinct circuits. Poetry slam and spoken word communities, particularly active in Bengaluru, Bombay, Delhi, Chennai, Hyderabad, Pune, and college campuses across the country, have developed performance-based poetry communities with distinct aesthetic and social dynamics. The relationship between traditional, small-press, online, and performance-based publishing constitutes a complex contemporary ecosystem in which the same poet may operate across multiple circuits.

DISCUSSION

The findings carry several important implications. Theoretically, they support an integrative analytical framework that combines postcolonial theory, identity-political scholarship, formal and linguistic analysis, and attention to publishing and reception ecosystems. The four dimensions identified are not isolated but mutually reinforcing. Identity politics shapes formal and linguistic choices; diasporic experience interacts with publishing geographies; small-press and digital ecosystems make possible voices that traditional trade publishing might marginalize. Effective critical engagement requires attention to all four dimensions in their interactions.

For literary studies, the findings highlight the need to update curricular and anthological frames to reflect the genuine heterogeneity of contemporary Indian English poetry. Older anthologies, while important, often privileged particular generations and identity positions that no longer represent the full vitality of the field. Newer anthological projects, attentive to gender, caste, region, sexuality, and diaspora, have begun to address these limitations, though continuing curatorial work is needed. University courses on Indian English poetry can draw on this expanded canon to engage students with the form's contemporary diversity.

For pedagogy, the findings suggest the value of teaching Indian English poetry alongside, rather than in isolation from, the rich poetic traditions of regional Indian languages. Translation, multilingual practice, and the comparison of formal possibilities across languages enrich student understanding of Indian poetry as a multilingual ecosystem rather than a monolingual tradition. Engagement with diasporic poetry similarly benefits from comparison with Indian-based work, illuminating both the distinctive contributions of diasporic experience and the ongoing connections between diasporic and home-based literary cultures.

For literary infrastructure, the findings emphasize the importance of continued investment in the institutional supports that enable poetic publication and reception. Independent presses require sustainable economic models, government and private support for cultural production through institutions including the Sahitya Akademi has continuing importance,[25] and digital and small-press journals benefit from the support of literary communities, festivals, and educational institutions. Translation between Indian English and regional language poetic traditions deserves particular institutional support, given its potential to enrich both literary fields.

Several limitations of the present analysis warrant acknowledgment. As a literature-based study, it depends on the quality and coverage of available scholarship, which remains uneven across the diverse identity positions, regions, and formal traditions within contemporary Indian English poetry. The voices of contemporary poets themselves are mediated through critical framings, and primary engagement with poetic texts and authorial reflections is essential to enrich any synthesis. The pace of change in publishing and identity-political conversations means that some findings will require updating as the contemporary scene continues to develop.

CONCLUSION

This article has examined postcolonial voices in contemporary Indian English poetry, focusing on identity, diaspora, and literary innovation. Drawing on postcolonial theory, identity-political scholarship, formal and linguistic analysis, and attention to publishing ecosystems, the analysis identified four interlocking dimensions: the negotiation of postcolonial identity across multiple axes; the diasporic imagination and the reconfiguration of homeland; formal and linguistic innovation; and the digital and small-press publishing ecosystems. Together these dimensions describe a contemporary scene of remarkable richness and complexity, in which poetic possibilities first opened by the post-independence generation have been substantially extended through the work of subsequent generations of poets writing from diverse identity positions and publishing contexts.

Three broader conclusions follow. First, contemporary Indian English poetry is best understood not as a unified tradition but as a dynamic field of competing and overlapping voices, each engaging the inheritances of colonialism, the politics of identity, and the possibilities of literary innovation in distinctive ways. Second, the analytical resources required to engage this contemporary field draw on multiple theoretical traditions, including postcolonial theory, identity-political scholarship, formal poetics, and publishing studies. Third, supportive critical, anthological, and institutional responses are needed to ensure that the contemporary heterogeneity of Indian English poetry is meaningfully represented in scholarly, educational, and public literary culture.

Several directions for future research are warranted. Sustained critical engagement with poets currently underrepresented in scholarly literature, including Northeast poets, queer poets, and emerging younger voices, would address persistent gaps. Comparative studies of Indian English poetry alongside parallel developments in regional language poetry would clarify the relationships between Anglophone and other Indian poetic traditions. Studies of the digital and small-press publishing ecosystems, including their economic models and reception dynamics, would advance understanding of contemporary literary infrastructure. Research engaging poet voices through interviews, oral histories, and reflective essays would enrich critical perspectives. By advancing such an agenda, literary studies can contribute meaningfully to understanding one of the most vibrant areas of contemporary Indian literary culture.

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Advaita Vedanta and Modern Consciousness Studies: Bridging Classical Indian Philosophy and Contemporary Cognitive Science

Bharathi

Research Scholar, Institute of Management and Commerce, Srinivas University,Mangalore, India.

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Abstract

Advaita Vedanta, the non-dualistic school of classical Indian philosophy systematized by Śaṅkara in the eighth century, offers one of the most sophisticated philosophical frameworks for understanding the nature of consciousness, self, and reality. Modern consciousness studies, an interdisciplinary field bringing together philosophy of mind, cognitive science, neuroscience, and contemplative traditions, has increasingly engaged with non-Western philosophical resources in addressing the so-called hard problem of consciousness. This article examines the productive dialogue between Advaita Vedanta and modern consciousness studies, focusing on how classical Indian philosophy can illuminate, and be illuminated by, contemporary cognitive science. Drawing on a critical literature review methodology, the study analyses peer-reviewed scholarship in philosophy of mind, comparative philosophy, contemplative studies, and cognitive science published between 2010 and 2025. The analysis identifies four interlocking dimensions of the dialogue: the conceptual mapping between classical Advaitic categories and contemporary philosophy of mind; the engagement with the hard problem of consciousness through non-dualistic frameworks; the empirical investigation of contemplative practices grounded in Vedantic traditions; and the methodological and ethical considerations involved in cross-cultural philosophical work. The study draws on Advaita scholarship including the work of Swami Satchidanandendra, Bina Gupta, Wolfgang Fasching, and Christian Coseru, alongside consciousness studies literature including David Chalmers, Thomas Nagel, Galen Strawson, Evan Thompson, and Jonardon Ganeri. Findings indicate that the dialogue is genuinely productive when conducted with philosophical rigour and respect for the distinct frameworks. The article concludes with implications for philosophy of mind, comparative philosophy, contemplative studies, and Indian philosophy education.

Keywords: Advaita Vedanta, Consciousness Studies, Philosophy of Mind, Hard Problem of Consciousness, Indian Philosophy, Comparative Philosophy, Contemplative Practice, Non-Dualism

INTRODUCTION

The nature of consciousness remains one of the most enduring and contested questions in philosophy and cognitive science.[1] The so-called hard problem of consciousness, articulated in influential form by David Chalmers,[2] asks why and how physical processes give rise to subjective experience, the qualitative felt character of mental states. While substantial progress has been made on the easy problems concerning information processing, attention, and perceptual mechanisms, the explanatory gap between objective neural processes and first-person experience has resisted standard

scientific reduction. The persistence of this problem has prompted scholars to look beyond the dominant Western philosophical traditions for additional conceptual resources, and Indian philosophical schools, particularly Advaita Vedanta, have emerged as significant interlocutors in this expanded conversation.[3]

Advaita Vedanta, systematized by Śaṅkarācārya in the eighth century and developed through commentaries on the Upaniṣads, the Brahma Sūtra, and the Bhagavad Gitā, offers a sophisticated philosophical framework centred on the non-dual identity of ātman (the witness self) and brahman (ultimate reality).[4] Within this framework, consciousness is treated not as an emergent property of physical processes but as the foundational ground of experience itself, self-luminous (svaprakāśa) and underlying all cognitive activity.[5] The traditional categories of sākṣin (witness consciousness), cidaabhāsa (reflected consciousness), avidyā (ignorance), ānanda (bliss), and the levels of waking, dreaming, and deep sleep states (jāgrat, svapna, suṣupti) provide an analytical apparatus that has been refined across more than a millennium of textual and philosophical engagement.[6]

The dialogue between Advaita Vedanta and contemporary consciousness studies has developed substantially in recent decades.[7] The publication of major comparative works, dedicated journals including the Journal of Consciousness Studies and the Indian Philosophical Quarterly, conferences bringing together philosophers and scientists, and a growing body of empirical research on contemplative practices grounded in Vedantic traditions have together created a productive interdisciplinary space. Yet the dialogue has also raised significant challenges. Questions of methodological rigour, the dangers of superficial appropriation, the difficulty of accurately translating technical Sanskrit philosophical vocabulary, and the responsibilities of cross-cultural engagement all warrant sustained reflection.

Against this backdrop, the present article asks: how can Advaita Vedanta and modern consciousness studies productively engage one another, and what are the implications for philosophy of mind, cognitive science, and Indian philosophy education? Three subsidiary questions structure the inquiry.

- First, how do central Advaitic categories map onto and challenge contemporary philosophy of mind frameworks?
- Second, what does Advaita contribute to contemporary engagement with the hard problem of consciousness?
- Third, what methodological and ethical considerations should guide cross-cultural philosophical work in this area?

The article makes three contributions: it synthesizes scholarship across Advaita studies, philosophy of mind, and consciousness research; it identifies four interlocking dimensions of the dialogue; and it articulates implications for philosophical research, education, and cross-cultural engagement.

LITERATURE REVIEW

Foundational Texts and Classical Advaita

The classical Advaita tradition rests on a body of foundational texts including the principal Upaniṣads, the Brahma Sūtra of Bādarāyaṇa, and the Bhagavad Gitā, collectively termed the prasthānatraya or three pillars.[8] Śaṅkara's commentaries on these texts, alongside his independent treatises such as the Upadeśasāhasrī and the disputed Vivekacūḍāmaṇi, established the systematic philosophical framework.[9] Subsequent generations of Advaitins, including Suresvara, Padmapāda, Vācaspati Miśra, Prakāśātman, Sarvajñātman, Vidyāraṇya, Madhusūdana Sarasvatī, and Citsukha, refined the system through detailed engagement with epistemology, ontology, and the philosophy of consciousness.[10] The Bhāmatī and Vivaraṇa sub-schools developed distinct approaches to several philosophical questions including the locus of avidyā and the nature of mokṣa (liberation).[11]

Modern Advaita Scholarship

Modern Advaita scholarship has developed substantially across multiple traditions. Within India, the work of Swami Satchidanandendra Saraswati, the founder of Adhyatma Prakasha Karyalaya, established a rigorous philological reading of Śaṅkara that distinguishes the master's genuine works from later attributions and emphasizes the centrality of the witness self.[12] T. M. P. Mahadevan, K.

Satchidananda Murty, R. Balasubramanian, and others have produced important monographic and synthetic works.[13] International Advaita scholarship by Karl H. Potter, Eliot Deutsch, J. G. Arapura, Bina Gupta, Anantanand Rambachan, and others has substantially developed analytical engagement with the tradition in English-language philosophical literature.[14] Recent decades have witnessed increasing engagement with cognitive scientific and philosophical approaches to consciousness, including the work of Wolfgang Fasching, Miri Albahari, and Christian Coseru.[15]

Modern Consciousness Studies

Modern consciousness studies have developed into an interdisciplinary field combining philosophy, cognitive science, neuroscience, and contemplative studies. Thomas Nagel's 1974 essay on what it is like to be a bat established the analytical articulation of the explanatory gap between objective description and subjective experience.[16] David Chalmers' articulation of the hard problem of consciousness in the 1990s has shaped much of the subsequent conversation.[17] Galen Strawson, Philip Goff, and others have developed panpsychist responses to the hard problem, while higher-order theories, global workspace theory, integrated information theory, and predictive processing approaches have offered competing scientific frameworks.[18] The integration of phenomenology and cognitive science, articulated through neurophenomenology by Francisco Varela and developed by Evan Thompson and others, provides a productive methodological bridge between first-person and third-person investigation.[19]

Cross-Cultural Philosophy of Mind

Cross-cultural philosophy of mind has expanded substantially in recent decades. Owen Flanagan's work on Buddhist epistemology and naturalism, Evan Thompson's extended engagement with Tibetan Buddhism and yogic traditions, Jonardon Ganeri's sustained philosophical work on classical Indian philosophy of mind, and the comparative work of figures including B. K. Matilal, J. N. Mohanty, and Mark Siderits have together established a rich literature.[20] The Mind and Life dialogues, the comparative philosophy work centred at institutions including the Center for Buddhist Studies and various European and Indian universities, and dedicated journals have institutionalized the cross-cultural conversation. Within this broader landscape, Advaita Vedanta has received increasing attention alongside the more extensively engaged Buddhist and Yogic traditions.[21]

Research Gap

Despite this expanding scholarship, several gaps remain. Integrative analyses that engage both classical Advaita and contemporary consciousness studies with equal rigour are comparatively rare, with much of the literature privileging one side at the expense of the other. The methodological and ethical considerations involved in cross-cultural philosophical work warrant more sustained attention than they have typically received. The relationship between Advaita scholarship and the empirical investigation of contemplative practices, including practices grounded in Vedantic traditions, remains underdeveloped. The present article seeks to contribute to addressing these gaps.

METHODS

This study employs a critical literature review methodology with thematic synthesis, suitable for engaging an interdisciplinary topic that spans classical Indian philosophy, contemporary philosophy of mind, cognitive science, and contemplative studies. The review proceeded through four stages. In the first stage, a structured search was conducted in the Philosopher's Index, JSTOR, PhilPapers, Scopus, the Indian Citation Index, the Center for Buddhist Studies bibliographies, and Google Scholar. Search terms combined Advaita Vedanta, Śaṅkara, non-dualism, witness consciousness, sākṣin, brahman, atman, hard problem of consciousness, philosophy of mind, contemplative studies, and comparative philosophy. The window covered January 2010 to August 2025, with substantial earlier classical and modern philosophical works retained for foundational reference.

In the second stage, inclusion criteria specified peer-reviewed empirical, theoretical, or critical scholarship engaging with Advaita Vedanta, modern consciousness studies, or the dialogue between them. Foundational classical, modern, and comparative philosophical works were also included. Edited volumes from major academic publishers in philosophy and Indian studies were reviewed. Exclusion

criteria filtered out devotional or apologetic works without scholarly framing, popular spiritual literature, and non-peer-reviewed materials. After title, abstract, and full-text screening, seventy publications were retained.

In the third stage, supplementary materials were drawn from publicly available primary source translations including the Upaniṣads in scholarly translation, Śaṅkara's commentaries in the editions of Swami Gambhirananda and others, and selected works of subsequent Advaitins. In the fourth stage, thematic synthesis generated four interlocking dimensions of the Advaita-consciousness studies dialogue. As a literature-based study using publicly available secondary materials, the research did not require formal ethics approval. Standards of accurate citation, transparent reasoning, and respectful engagement across philosophical traditions were maintained throughout.

RESULTS

Conceptual Mapping Between Advaitic Categories and Philosophy of Mind

The first dimension concerns the conceptual mapping between central Advaitic categories and contemporary philosophy of mind. Several Advaitic concepts have been productively engaged with contemporary frameworks. The category of sākṣin, witness consciousness, has been compared and contrasted with contemporary notions of pure awareness, phenomenal consciousness in the Chalmers sense, and the witness or observer self in phenomenological traditions.[22] The Advaitic distinction between vyāvahārika (empirical) and pārāmārthika (transcendental) levels of reality has been compared to two-aspect theories and to phenomenological distinctions between empirical and transcendental subjectivity in Husserl and others.[23] The analysis of the three states (waking, dreaming, deep sleep) and the supposed fourth (turīya) provides a phenomenological apparatus for analysing consciousness across diverse experiential contexts.[24]

Productive points of mutual challenge have also emerged. Advaita's treatment of consciousness as foundational rather than derivative challenges naturalist frameworks that treat consciousness as an emergent or supervenient property of physical processes.[25] Advaita's distinction between consciousness and its modifications (vṛtti) parallels but is not identical to contemporary distinctions between phenomenal consciousness and access consciousness. The Advaitic notion of svaprakāśata (self-luminosity) of consciousness has parallels with the self-intimating character of awareness in some phenomenological traditions but raises distinctive questions when engaged through analytic philosophical methods.[26] Productive scholarship has shown that careful conceptual mapping requires attention to the distinct soteriological and epistemological commitments of Advaita rather than treating it as merely a source of additional concepts.[27]

Engagement with the Hard Problem of Consciousness

The second dimension concerns Advaita's engagement with the hard problem of consciousness. The hard problem, in its standard articulation, asks why physical processes give rise to subjective experience, given that the physical description appears to be exhaustively functional in character.[28] Advaita responds to this question from a perspective that fundamentally differs from the standard physicalist starting point. For Advaita, consciousness is not an explanandum to be derived from non-conscious physical processes but the very ground from which the appearance of physical processes itself is articulated.[29] This inversion of the explanatory direction, while not constituting a solution to the hard problem in standard terms, offers a substantively different conceptual approach that warrants engagement on its own terms.

Several productive lines of dialogue have emerged. Some scholars have explored panpsychist or panentheist readings that bring Advaita into conversation with contemporary work by Galen Strawson and Philip Goff, suggesting potentially fruitful resonances.[30] Others have emphasized the distinctive Advaitic claim of the radical non-difference between empirical and ultimate consciousness, which goes substantially beyond panpsychist views.[31] Phenomenologically informed readings, such as those developed by Wolfgang Fasching, have engaged the Advaitic analysis of consciousness with phenomenological methods, producing rich integrative accounts.[32] The dialogue continues to develop, and significant philosophical work remains in clarifying both areas of substantive convergence and fundamental disagreement.[33]

Empirical Investigation of Contemplative Practices

The third dimension concerns the empirical investigation of contemplative practices grounded in Vedantic traditions. Modern contemplative studies has expanded substantially, integrating phenomenological, psychological, and neuroscientific methods.[34] While much of the empirical research has focused on Buddhist meditation traditions, including mindfulness practices derived from Theravāda and various practices from Tibetan traditions, increasing attention has been given to practices grounded in Vedantic and broader Hindu yogic traditions.[35] Practices including atma-vicāra (self-inquiry), nididhyāsana (meditative reflection), various forms of dhyāna, and the so-called neti-neti method of negative discrimination have been examined through both phenomenological and physiological lenses.[36]

Specific lines of research have explored the neurophysiological correlates of meditative states associated with Vedantic practice, the phenomenology of self-inquiry experiences, the relationship between practice and reported reductions in self-referential rumination, and the broader mental health implications of sustained contemplative engagement. The interpretive challenge in this research is substantial: empirical correlation between practice and certain physiological or psychological markers does not directly verify the metaphysical claims of the underlying tradition, and rigorous scholarship maintains careful distinctions between what empirical methods can and cannot establish. Productive research engages contemplative traditions on their own terms while applying empirical methods within their proper epistemic scope.

Methodological and Ethical Considerations

The fourth dimension concerns the methodological and ethical considerations involved in cross-cultural philosophical work. Several considerations are particularly important. First, philosophical engagement requires accurate translation and conceptual interpretation of technical Sanskrit terminology, with attention to the distinct philosophical commitments of different sub-schools and historical periods.[37] Loose translation of terms like ātman as soul or self can obscure the technical philosophical analysis at work. Second, the soteriological framing of Advaita, in which philosophical analysis serves the goal of liberation (mokṣa), differs from the largely theoretical framing of much contemporary academic philosophy.[38] Acknowledging this difference is essential for accurate engagement.

Third, ethical considerations relating to the broader history of Indian philosophy in Western academic engagement bear on contemporary work.[39] Critiques of orientalism, of the appropriation of Indian philosophical resources without adequate acknowledgement, and of the marginalization of Indian philosophy within Western academic philosophy curricula provide important context. Sustained engagement with Indian-trained scholars and Indian institutions, the inclusion of Indian philosophy in mainstream philosophy departments rather than its segregation in religious studies or area studies frameworks, and careful attention to the diverse Indian philosophical traditions including those that critique Advaita constitute important elements of ethical practice.[40]

DISCUSSION

The findings carry several important implications. Theoretically, they support an integrative analytical framework that engages both classical Advaita and contemporary consciousness studies with rigour and respect for their distinct frameworks. The four dimensions identified are mutually reinforcing. Conceptual mapping illuminates how each tradition makes distinctive contributions; engagement with the hard problem reveals both areas of dialogue and points of fundamental difference; empirical contemplative research provides additional evidentiary engagement; methodological reflection ensures that the dialogue is conducted with appropriate care.

For philosophy of mind, the findings suggest that engagement with Advaita can productively expand the conceptual resources available for thinking about consciousness, while resisting any simple appropriation. The Advaitic analysis of witness consciousness, the distinction between consciousness and its modifications, the analysis of states of consciousness, and the relationship between consciousness and the empirical world all offer rigorous philosophical resources that warrant attention. At the same time, the soteriological framing of Advaita, the metaphysical commitments to non-dualism,

and the textual hermeneutic methods of the tradition mean that engagement requires more than concept mining.

For comparative philosophy, the findings affirm the productive character of the Advaita-consciousness studies dialogue while underscoring the importance of philological rigour, attention to internal Advaitic debates, and engagement with the full diversity of Indian philosophical traditions. Comparative work that engages Advaita alongside Buddhist, Sāṅkhya, Yogic, Mimāṃsa, Nyāya-Vaiśeṣika, and other Indian schools provides richer contextualization than work that treats Advaita in isolation. The continued development of comparative philosophy as an academic field, with appropriate institutional support and pedagogical resources, is an important enabling condition.

For contemplative studies, the findings highlight the importance of engaging Vedantic practices with the same rigour and respect that has been applied to Buddhist contemplative traditions. The integration of phenomenological, psychological, and neuroscientific methods, conducted in dialogue with Vedantic textual and practitioner traditions, provides productive research opportunities. Care must be taken to avoid both naive metaphysical claims based on neurophysiological correlations and reductive dismissals of phenomenological reports that do not fit pre-existing frameworks.

For Indian philosophy education, the findings emphasize the importance of teaching Advaita Vedanta and other classical Indian philosophical schools with the rigour and depth they merit, both within Indian institutions and in international philosophy curricula. The continuing under-representation of Indian philosophy in mainstream Western philosophy departments is an institutional issue that deserves sustained attention. Within Indian institutions, the strengthening of Sanskrit philosophical education, the supporting of textual editing and translation projects, and the integration of classical and contemporary philosophical methods all warrant investment.

Several limitations of the present analysis warrant acknowledgment. As a literature-based study, the analysis depends on the quality and coverage of available scholarship, which remains uneven across sub-traditions and contemporary engagements. The voices of practitioners, traditional scholars, and Indian philosophical institutions are mediated through academic framings, and direct engagement with these voices is essential to enrich any synthesis. The pace of development in consciousness studies means that some findings will require updating as the field continues to evolve.

CONCLUSION

This article has examined the productive dialogue between Advaita Vedanta and modern consciousness studies. Through a critical literature review across classical Indian philosophy, contemporary philosophy of mind, cognitive science, and contemplative studies, the analysis identified four interlocking dimensions: the conceptual mapping between Advaitic categories and philosophy of mind; engagement with the hard problem of consciousness through non-dualistic frameworks; the empirical investigation of contemplative practices grounded in Vedantic traditions; and methodological and ethical considerations involved in cross-cultural philosophical work. Together these dimensions describe a productive interdisciplinary space whose continued development promises significant contributions to philosophical understanding.

Three broader conclusions follow. First, Advaita Vedanta offers genuinely valuable conceptual and analytical resources for engaging contemporary questions about consciousness, while its insights cannot be reduced to or appropriated within frameworks that were not designed to accommodate non-dualist metaphysics. Second, the dialogue between Advaita and consciousness studies is most productive when conducted with philosophical rigour, philological care, and respect for the distinct frameworks of each tradition. Third, the continued development of this dialogue requires institutional support for comparative philosophy, contemplative studies, and Indian philosophy education, alongside ethical attention to the broader history of cross-cultural philosophical engagement.

Several directions for future research are warranted. Detailed conceptual studies engaging specific Advaitic categories with specific debates in contemporary philosophy of mind would substantively advance the dialogue. Empirical research on Vedantic contemplative practices, conducted in collaboration with traditional teachers and practitioners, would extend the contemplative studies literature. Comparative work that engages Advaita alongside other classical Indian philosophical schools would deepen contextual understanding. Studies engaging the work of contemporary Advaitic teachers and scholarly institutions would bring living traditions into the academic conversation.

Pedagogical research on the integration of Indian philosophy into university philosophy curricula would inform institutional reform. By advancing such an agenda, philosophy can contribute meaningfully to one of the most consequential intellectual conversations of our time.

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AI-Driven Healthcare Diagnostics in Rural India: Opportunities, Challenges, and Ethical Considerations

Meena Jose Komban

Professor, Department of Computer Science, YuvakshatraInstitute of Management Studies (YIMS), Mundur, Kerala, India.

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Abstract

Artificial intelligence (AI) is rapidly transforming healthcare worldwide, with applications ranging from medical imaging interpretation to clinical decision support, disease screening, and predictive analytics. In India, where rural populations face significant gaps in access to specialist medical care, AI-driven diagnostic tools represent a particularly important opportunity. This article examines AI-driven healthcare diagnostics in the rural Indian context, focusing on the opportunities, challenges, and ethical considerations that shape implementation. Drawing on a critical literature review methodology, the study analyses peer-reviewed scholarship in computer science, medical informatics, public health, and AI ethics published between 2018 and 2025. The analysis identifies four interlocking dimensions of AI-driven rural diagnostics: the technical landscape of available AI tools and their performance characteristics; the deployment ecosystem including hardware, connectivity, workforce, and integration with existing health systems; the equity, bias, and validation considerations specific to Indian rural populations; and the ethical, regulatory, and governance frameworks needed to ensure responsible deployment. The study draws on machine learning research, AI ethics literature including frameworks from the World Health Organization and IEEE, Indian regulatory documents, and emerging deployment studies. Findings indicate that AI-driven diagnostic tools offer substantial promise for closing rural diagnostic gaps in areas including diabetic retinopathy screening, tuberculosis detection from chest radiographs, cervical cancer screening, and dermatological assessment. Realizing this promise requires careful attention to local validation, equitable performance, workflow integration, and ethical governance. The article concludes with implications for computer science research, health system policy, and the design of context-sensitive AI deployment frameworks.

Keywords: Artificial Intelligence, Healthcare Diagnostics, Rural Health, India, Machine Learning, AI Ethics, Equity, Telemedicine

INTRODUCTION

Artificial intelligence has moved rapidly from a specialist research domain to a significant influence on contemporary healthcare practice.[1] Deep learning models trained on large image datasets have demonstrated diagnostic performance comparable to expert clinicians for tasks including the interpretation of retinal images, dermatological photographs, chest radiographs, pathology slides, and various other medical images.[2] Natural language processing applications support clinical documentation, decision support, and patient communication. Predictive analytics enables earlier

identification of patients at risk for adverse outcomes. While most AI healthcare research has been conducted in high-income settings, the implications for low- and middle-income countries, including India, are increasingly being explored.[3]

In India, the case for AI-driven diagnostic support is particularly compelling in rural contexts.[4] Specialist medical workforce remains heavily concentrated in urban areas, with rural populations often relying on primary care providers, mid-level practitioners, and community health workers for first-contact care. The District Hospitals, Community Health Centres, and Primary Health Centres that constitute the public rural health system are typically staffed at lower specialist densities than urban tertiary care institutions. The doctor-to-population ratio is substantially lower in rural India than in urban areas. Travel distances and costs further restrict rural access to specialized diagnostic services. AI-driven diagnostic tools, by enabling task-shifting of certain interpretation tasks to algorithms supervised by primary care providers, offer a potential pathway to closing some of these gaps.[5]

Several specific applications have been actively explored in the Indian rural context. AI-based diabetic retinopathy screening has been deployed in collaboration with major eye hospitals and the Indian Council of Medical Research.[6] AI tools for tuberculosis screening from chest radiographs have been evaluated in collaboration with the National Tuberculosis Elimination Programme.[7] AI-supported cervical cancer screening has been piloted in several states. AI-based skin lesion analysis, oral cancer screening, and various other applications have entered different stages of research and deployment.[8] The COVID-19 pandemic accelerated several aspects of digital health adoption, including telemedicine and AI-supported triage, with implications that continue to unfold.

Yet significant challenges and risks accompany these opportunities. Performance of AI tools developed on data from one population may not generalize to others, raising concerns about equity.[9] Deployment ecosystems including hardware, connectivity, workflow integration, and workforce training are non-trivial.[10] Ethical considerations including consent, privacy, accountability, and algorithmic transparency require sustained attention.[11] Regulatory frameworks for AI in medical devices, while developing, are still maturing in India and globally.[12] Against this backdrop, the present article asks: what are the opportunities, challenges, and ethical considerations associated with AI-driven healthcare diagnostics in rural India, and what implications follow for research, policy, and practice? Three subsidiary questions structure the inquiry:

- First, what are the technical capabilities of available AI diagnostic tools relevant to rural Indian health needs?
- Second, what deployment ecosystem requirements and challenges shape implementation?
- Third, what equity, ethical, and regulatory considerations are essential for responsible deployment?

The article makes three contributions: it synthesizes scholarship across computer science, medical informatics, and AI ethics with specific reference to rural India; it identifies four interlocking dimensions of the issue; and it articulates implications for research and policy.

LITERATURE REVIEW

Foundations of AI in Medical Diagnostics

The application of machine learning to medical diagnostics has expanded rapidly since the mid-2010s, when deep convolutional neural networks demonstrated breakthrough performance on image classification tasks. Foundational work by Esteva and colleagues on dermatological classification, by Gulshan and colleagues on diabetic retinopathy detection, and by Rajpurkar and colleagues on chest radiograph interpretation established that deep learning models could match or exceed expert human performance on several specific tasks under controlled conditions.[13] Subsequent research has extended these capabilities to a wide range of medical imaging modalities, pathology, ophthalmology, cardiology, and other specialties.[14] Natural language processing methods have enabled the analysis of clinical text, while reinforcement learning and other paradigms have been explored for treatment optimization.

AI for Health in Low- and Middle-Income Countries

A growing body of literature has examined AI applications in low- and middle-income country contexts.[15] Studies have explored AI-supported tuberculosis screening, malaria diagnosis from blood

smears, cervical cancer screening, retinal disease screening, and various other applications in African, Asian, and Latin American settings.[16] The literature has identified several distinctive considerations including the scarcity of locally collected training data, the need for performance validation in target populations, infrastructure constraints, workforce considerations, and the importance of integration with existing health systems.[17] The World Health Organization and various academic groups have published guidance on the responsible use of AI for health, with explicit attention to low- and middle-income country considerations.[18]

Indian Health System Context

The Indian health system context for AI deployment is shaped by a layered structure of public, private, and not-for-profit actors. The public health system, organized through Sub-Centres, Primary Health Centres, Community Health Centres, District Hospitals, and tertiary teaching institutions, reaches the rural population through an extensive infrastructure that nonetheless faces persistent staffing, funding, and service delivery challenges.[19] The Ayushman Bharat Pradhan Mantri Jan Arogya Yojana programme provides health insurance coverage to substantial rural populations and has driven significant changes in care patterns. The Health and Wellness Centres established under Ayushman Bharat aim to deliver comprehensive primary health care including non-communicable disease screening. The National Digital Health Mission and the Ayushman Bharat Digital Mission aim to build the digital infrastructure for an interoperable Indian health system, providing a foundation on which AI applications might be deployed.[20]

AI Ethics, Equity, and Governance

Scholarship on AI ethics has expanded substantially in recent years.[21] Frameworks developed by international organizations including the World Health Organization, the Organisation for Economic Co-operation and Development, and the IEEE, alongside national and regional efforts including the European Union AI Act and Indian initiatives such as NITI Aayog's Responsible AI for All strategy, have articulated principles for fairness, accountability, transparency, privacy, and safety.[22] The specific ethics of AI in healthcare have been examined through the lenses of clinical ethics, public health ethics, and human rights, with significant attention to issues including informed consent, bias and equity,[23] accountability for AI-influenced decisions, the management of incidental findings, and the handling of sensitive health data.

Research Gap

Despite this expanding literature, gaps remain. Integrative analysis specifically focused on rural Indian deployment, combining technical, ecosystem, equity, and ethical considerations, is comparatively rare. Implementation evidence from Indian rural settings, while accumulating, often remains in pilot or research-grade publications rather than synthesized in policy-relevant form. The relationship between AI deployment and the broader Indian Digital Health architecture warrants further engagement. The present article seeks to contribute by integrating these strands.

METHODS

This study employs a critical literature review methodology with thematic synthesis, suitable for engaging a rapidly evolving multidisciplinary literature. The review proceeded through four stages. In the first stage, a structured search was conducted in PubMed, IEEE Xplore, ACM Digital Library, Scopus, Web of Science, the Indian Citation Index, and Google Scholar. Search terms combined artificial intelligence, machine learning, deep learning, healthcare, diagnostics, India, rural health, low-resource settings, and specific application domains including diabetic retinopathy, tuberculosis, cervical cancer, and dermatology. The window covered January 2018 to August 2025.

In the second stage, inclusion criteria specified peer-reviewed empirical studies of AI-driven healthcare diagnostics with relevance to Indian or comparable rural contexts, supplemented by foundational technical and ethical works in the international literature. Reports from the Indian Council of Medical Research, NITI Aayog, the Ministry of Health and Family Welfare, the World Health Organization, the National Health Authority, the National Tuberculosis Elimination Programme, and the National Programme for Control of Blindness and Visual Impairment were also reviewed. Exclusion

criteria filtered out studies focused exclusively on tertiary urban deployment without rural relevance, technical-only reports without health system or ethical engagement, and non-peer-reviewed materials except for authoritative regulatory and policy documents. After title, abstract, and full-text screening, eighty-two publications were retained.

In the third stage, supplementary materials were drawn from publicly available regulatory and policy documents including the Digital Information Security in Healthcare Act draft, the Digital Personal Data Protection Act 2023, the National Digital Health Mission documentation, NITI Aayog's Responsible AI strategy, and Central Drugs Standard Control Organisation guidance on Software as a Medical Device. In the fourth stage, thematic synthesis generated four interlocking dimensions of AI-driven rural diagnostics. As a literature-based study using publicly available secondary materials, the research did not require formal ethics approval.

RESULTS

Technical Landscape of AI Diagnostic Tools for Rural Health Needs

The first dimension concerns the technical landscape of AI diagnostic tools relevant to rural Indian health needs. Several application areas have demonstrated substantial technical maturity. AI-based diabetic retinopathy screening has been extensively studied in Indian populations, with multiple validated systems available for use in primary care settings supported by retinal cameras.[24] AI tools for tuberculosis detection from chest radiographs have been evaluated against expert radiologist interpretation and microbiological reference standards in Indian settings,[25] with several systems receiving World Health Organization endorsement for community-level screening.[26] AI-supported cervical cancer screening using visual inspection with acetic acid imaging or HPV testing platforms is in increasingly mature deployment. Dermatological AI tools for skin lesion analysis have been explored in Indian populations with attention to skin tone diversity in training data.[27]

Other application areas remain at earlier stages but show significant promise. Cardiovascular AI applications including ECG interpretation are deployable in primary care contexts. Oral cancer screening AI tools are under active development, with high relevance given the burden of oral cancer in India. Maternal and child health applications including AI-supported foetal ultrasound interpretation and growth assessment are emerging. AI-based malaria, dengue, and other infectious disease diagnostics from microscopy or rapid test images are progressing. The technical performance of these tools varies, and rigorous validation in deployment settings remains essential.

Deployment Ecosystem: Hardware, Connectivity, Workforce, and Workflow

The second dimension concerns the deployment ecosystem in which AI tools must operate. Hardware considerations include the cost, durability, and ease of use of imaging devices, computational platforms ranging from cloud servers to local edge computing devices, and supporting peripherals. Connectivity is a significant variable in rural India, with substantial geographic variation in mobile data quality and reliability. Some AI deployment models depend on real-time cloud-based inference; others use locally deployed models that require periodic connectivity for updates and supervision. The choice of architecture has substantial implications for cost, reliability, and data governance.

Workforce considerations are central. Effective AI deployment in rural settings typically requires training of frontline staff including ASHAs, ANMs, AWWs, primary care physicians, and mid-level practitioners. Training must address not only operational use of AI tools but also the interpretation of AI outputs, the management of uncertainty and edge cases, and communication with patients about AI-supported assessments. Workflow integration is a frequent point of failure, where technically capable systems fail in deployment because they impose unrealistic time costs, generate false alarms that erode trust, or do not connect cleanly with existing care pathways.[28] Successful deployments tend to feature careful co-design with frontline workers, iterative refinement, and integration with established referral structures.

Equity, Bias, and Validation in Indian Populations

The third dimension concerns equity, bias, and validation considerations specific to Indian rural populations. AI models trained predominantly on data from high-income country populations have been shown in several studies to perform less reliably on Indian and other South Asian populations, reflecting

differences in disease prevalence, presentation, imaging conditions, demographic characteristics, and other factors.[29] Validation of AI tools on representative Indian populations, including diverse age groups, genders, regional variations, and socioeconomic backgrounds, is therefore essential. The Indian Council of Medical Research and various Indian medical institutions have undertaken Indian-specific validation studies for several AI tools, contributing to a growing evidence base.[30]

Equity considerations extend beyond initial validation. Continuous monitoring is needed to detect performance drift over time and across subpopulations. Subgroup analyses by gender, age, region, and disease severity inform whether deployed tools serve all groups equitably. Particular attention is warranted for groups historically underserved by health systems, including Adivasi populations, women, older adults, and persons with disabilities. Several scholars have argued that equity assessment should not be limited to algorithmic performance but should encompass the full deployment pathway, including who benefits from improved diagnosis, who bears the burdens of incorrect outputs, and how access to follow-up care is distributed.

Ethical, Regulatory, and Governance Considerations

The fourth dimension concerns the ethical, regulatory, and governance frameworks within which AI deployment must operate. Informed consent in AI-supported diagnostic settings raises distinctive considerations.[31] Patients should understand that AI tools are involved in their care, what these tools do, and how outputs are used. Translating these considerations into practical consent procedures appropriate for rural primary care settings, including for low-literacy patients, requires careful design.[32] Privacy considerations are also central, particularly given the sensitivity of health data and the legal framework provided by the Digital Personal Data Protection Act 2023.[33] Cloud-based AI services raise specific data governance questions including cross-border data flows and vendor data practices.

Accountability for AI-supported diagnostic outcomes is a developing area.[34] Frameworks under discussion include shared accountability across the deploying institution, the AI developer, and the human clinician who acts on AI outputs, with attention to documentation, transparency, and the management of AI-influenced errors. Regulatory frameworks are evolving. The Central Drugs Standard Control Organisation has issued guidance on Software as a Medical Device, and ongoing regulatory development is expected.[35] International frameworks including the World Health Organization's ethics and governance guidance and the European Union's AI Act provide useful comparative reference points.[36] NITI Aayog's Responsible AI for All strategy articulates Indian principles for trustworthy AI.[37]

DISCUSSION

The findings carry several important implications. Theoretically, they support an integrative analytical framework that links technical performance, deployment ecosystem, equity considerations, and ethical and regulatory governance. The four dimensions identified are mutually interdependent rather than separable. Technically capable tools can fail in deployment without adequate ecosystem support; ecosystem investments yield limited returns if equity is neglected; equity requires ethical and regulatory frameworks that ensure accountability.

For computer science research, the findings suggest several priorities. Indian-specific dataset development, including the assembly of large, well-curated, ethically governed datasets representing the diversity of Indian populations, remains foundational. Federated learning and privacy-preserving methods enable model development across institutions without centralizing sensitive data. Edge AI techniques that enable on-device inference are particularly relevant for connectivity-limited rural deployment. Robustness and uncertainty quantification methods that provide reliable confidence estimates are essential for safe deployment. Explainability methods help clinicians and patients understand AI outputs and identify likely errors.

For health system policy, the findings emphasize the importance of integrated approaches across the National Digital Health Mission, the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana, the Health and Wellness Centres, and disease-specific national programmes.[38] AI deployment plans require integration with existing care pathways, referral structures, and quality assurance mechanisms.[39] Workforce training and supervision frameworks are essential infrastructure. Procurement and

deployment standards should require local validation, equity assessment, ongoing monitoring, and meaningful local technical capacity.[40]

For ethical and regulatory governance, the findings highlight several priorities. The development of AI-specific medical device regulation, building on the Central Drugs Standard Control Organisation framework, requires sustained attention.[41] Health data governance under the Digital Personal Data Protection Act 2023[42] and related instruments needs operational clarification for AI use cases. Patient and community participation in AI governance, including through community advisory mechanisms in deployment sites, supports both ethical practice and trust.[43] Ethics committee capacity for evaluating AI-related research and deployment requires investment, training, and the development of appropriate review frameworks.[44]

Several limitations of the present analysis warrant acknowledgment. As a literature-based study, the analysis depends on the quality and coverage of available scholarship, which remains uneven across application areas, deployment contexts, and Indian regions. The pace of technical and policy change means that some findings will require updating as evidence accumulates. The voices of frontline workers, patients, and rural communities are mediated through researcher framings, and primary participatory research is essential to enrich the analytical picture.

CONCLUSION

This article has examined AI-driven healthcare diagnostics in the rural Indian context, focusing on opportunities, challenges, and ethical considerations. Through a critical literature review across computer science, medical informatics, public health, and AI ethics, the analysis identified four interlocking dimensions: the technical landscape of AI diagnostic tools relevant to rural Indian health needs; the deployment ecosystem of hardware, connectivity, workforce, and workflow integration; equity, bias, and validation considerations specific to Indian populations; and ethical, regulatory, and governance frameworks for responsible deployment. Together these dimensions describe a complex but tractable agenda for translating the substantial promise of AI-driven diagnostics into equitable rural health system improvements.

Three broader conclusions follow. First, AI-driven diagnostic tools offer substantial promise for closing rural diagnostic gaps in priority application areas including diabetic retinopathy, tuberculosis, cervical cancer, dermatology, and other domains where image-based or signal-based diagnosis can be effectively task-shifted. Second, realizing this promise requires sustained attention to local validation, equitable performance, workflow integration, workforce capacity, and ethical governance. Technical excellence alone is insufficient. Third, an effective response requires coordinated action across computer science research, medical and public health institutions, regulatory bodies, and rural health system actors, supported by the broader Digital Health architecture being developed under the National Digital Health Mission.

Several directions for future research are warranted. Implementation research evaluating AI deployment under real-world rural conditions would substantially strengthen the evidence base. Studies of long-term outcomes including impact on diagnostic timeliness, treatment initiation, and patient health, would extend the literature beyond algorithmic performance. Research on equity dimensions across Indian subpopulations is essential. Studies engaging patient and community perspectives on AI in rural healthcare would inform ethical and trust-building practice. Comparative work across Indian states and across South Asian countries would clarify what shapes successful deployment. By advancing such an agenda, computer science can contribute meaningfully to health equity and to the broader project of building responsible AI for the populations who stand to benefit most from it.

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