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Review Article

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"DEVELOPMENT AND VALIDATION OF A PEDAGOGICAL FRAMEWORK FOR PADARTH VIJNANA"

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ABSTRACT:

Introduction: Padarth Vijnana, the science of categories of existence, constitutes the philosophical bedrock of Ayurvedic education. Despite its foundational status in the Bachelor of Ayurvedic Medicine and Surgery (BAMS) curriculum, the pedagogy of this subject has remained largely traditional, relying on didactic lectures and rote memorisation. The absence of a structured, evidence-based pedagogical framework has been identified as a critical gap in contemporary Ayurvedic medical education. **Methods:** This review was conducted through a systematic search of electronic databases including PubMed, Google Scholar, AYUSH Research Portal, and DHARA (Digital Helpline for Ayurveda Research Articles) for literature published between 2000 and 2025. The search strategy employed terms including “Padarth Vijnana,” “Ayurvedic education,” “pedagogical framework,” “Vaisheshika,” “BAMS curriculum,” and “medical education pedagogy.” Classical Ayurvedic texts including Charaka Samhita, Sushruta Samhita, and Vaisheshika Darshana were also reviewed. A total of 87 sources were screened, and 42 met the inclusion criteria for qualitative synthesis. The review critically appraises existing teaching methodologies, proposes an integrated pedagogical framework grounded in constructivist learning theory and Bloom’s revised taxonomy, and outlines a validation strategy using mixed-methods approaches. **Results:** The review reveals that current pedagogical approaches to Padarth Vijnana teaching are predominantly lecture-based with limited active learning integration. The proposed framework organises the Padarth Vijnana syllabus across six cognitive domains, incorporating case-based learning, concept mapping, Socratic questioning, and clinical correlation modules. Comparative analysis of institutions that adopted active learning strategies for foundational Ayurvedic subjects demonstrated improved examination performance (12–18% increase in mean scores), enhanced conceptual retention at six months, and higher student satisfaction indices. The framework validation protocol employs pre-post assessment, Delphi expert consensus, and qualitative focus group analysis**. Discussion:** The findings support the integration of modern pedagogical principles with traditional Ayurvedic teaching methodologies. The proposed framework addresses the documented deficiencies in Padarth Vijnana instruction while preserving the epistemological integrity of classical Ayurvedic philosophy. Implementation challenges including faculty training, institutional resistance, and assessment redesign are discussed. The framework offers a replicable model for curricular reform across foundational BAMS subjects, aligning with the National Commission for Indian Systems of Medicine (NCISM) mandate for competency-based education.

Keywords: Active learning; Ayurvedic education; BAMS curriculum; Bloom’s taxonomy; Competency-based education; Constructivism; Medical education; NCISM; Padarth Vijnana; Pedagogical framework; Vaisheshika Darshana

INTRODUCTION

Padarth Vijnana, literally translated as the "science of categories of reality," occupies a unique and foundational position within the Ayurvedic educational framework. Derived from the Vaisheshika and Nyaya schools of Indian philosophy, this discipline systematically categorises all knowable entities into defined Padarthas (categories) and provides the conceptual vocabulary upon which the entire edifice of Ayurvedic theory and practice is constructed[1]. The Central Council of Indian Medicine (CCIM), and subsequently the National Commission for Indian Systems of Medicine (NCISM), have mandated Padarth Vijnana as a first-year compulsory subject in the Bachelor of Ayurvedic Medicine and Surgery (BAMS) programme, recognising its role as the philosophical gateway to Ayurvedic clinical reasoning[2].

The subject encompasses the study of Shad Padarthas (six categories) – *Dravya* (substance), *Guna* (quality), *Karma* (action), *Samanya* (generality), *Vishesha* (particularity), and *Samavaya* (inherence) – along with *Pramana Vijnana* (epistemology), the *Panchamahabhuta Siddhanta* (five-element theory), and the fundamental Ayurvedic doctrines of *Tridosha*, *Saptadhatu*, and *Trimala*[3]. These concepts, while profoundly systematic in their classical articulation, present significant pedagogical challenges owing to their abstract and philosophical nature, the requirement for Sanskrit literacy, and the necessity of bridging ancient ontological categories with modern biomedical understanding[4].

Despite the centrality of Padarth Vijnana in shaping Ayurvedic clinical thinking, its pedagogy has received remarkably little scholarly attention. The dominant instructional model across most Ayurvedic institutions continues to rely on teacher-centred didactic lectures, textbook reading, and summative examinations that reward memorisation over comprehension[5,6]. This pedagogical stasis exists against the backdrop of significant advances in medical education theory globally, where constructivist learning, competency-based curricula, and active learning strategies have become standard[7,8].

The present review aims to critically examine the existing pedagogical landscape of Padarth Vijnana instruction, identify the theoretical and practical gaps in current teaching-learning approaches, propose an integrated pedagogical framework drawing upon established educational theories, and outline a robust validation methodology for the proposed framework. In doing so, this review responds to the growing recognition within the Ayurvedic academic community that curricular modernisation must proceed hand-in-hand with pedagogical innovation[9,10].

HISTORICAL AND PHILOSOPHICAL CONTEXT OF PADARTH VIJNANA

Philosophical Roots

The intellectual origins of Padarth Vijnana are traceable to the Vaisheshika Sutra of Maharshi Kanada (circa 6th century BCE), which represents

one of the earliest systematic attempts at ontological classification in world philosophy[11]. Kanada's enumeration of six categories of reality provided a metaphysical framework that was subsequently adopted and adapted by Ayurvedic scholars as the foundational language for describing health, disease, and therapeutics. The Nyaya school of Maharshi Gautama complemented this ontological framework with a rigorous epistemological system (Pramana Shastra), offering methods for valid knowledge acquisition that remain central to Ayurvedic diagnostic reasoning[12].

Charaka Samhita, the foremost classical text of Ayurveda, explicitly acknowledges the debt of Ayurvedic science to the Vaisheshika categorical system. In the Sutrasthana, Charaka delineates the relationship between Padartha theory and clinical application, establishing that correct therapeutic action depends fundamentally on the accurate understanding of Dravya-Guna-Karma relationships[1,3]. The first chapter of Charaka Samhita (Deerghanjeeviteeya Adhyaya) itself sets the epistemological tone by discussing Pramana and methods of valid cognition, establishing that Ayurveda is not merely an empirical craft but a knowledge system grounded in philosophical rigour[13].

Padarth Vijnana in the Modern Curriculum

The formal inclusion of Padarth Vijnana as a distinct academic subject in the BAMS curriculum was consolidated through successive CCIM regulations, with the subject being taught in the first professional year alongside Ayurveda Itihas (history of Ayurveda)[2]. The CCIM syllabus prescribes instruction in Padartha classification, Pramana Vijnana, Panchamahabhuta, Dravya-Guna-Karma theory, and the fundamental principles of Samanya-Vishesha Siddhanta. The 2019 NCISM regulations further emphasised the need for competency-based education and formative assessment, creating a regulatory impetus for pedagogical reform[14].

However, the translation of syllabus content into effective learning experiences has been inconsistent across institutions. A survey of 24 Ayurvedic colleges in Maharashtra, Karnataka, and Gujarat revealed significant heterogeneity in teaching hours allocated to Padarth Vijnana (ranging from 120 to 200 hours), assessment patterns, and the extent of clinical correlation integrated into philosophical teaching [5]. This variability underscores the need for a standardised pedagogical framework that can ensure uniform quality of instruction while remaining adaptable to institutional contexts.

CURRENT PEDAGOGICAL LANDSCAPE

Prevailing Teaching Methods

The dominant instructional modality for Padarth Vijnana across Indian Ayurvedic institutions remains the traditional didactic lecture[5,6]. While lectures serve an important function in delivering structured content to large student groups, their effectiveness as the sole or primary mode of instruction for a subject as abstract and philosophically demanding as Padarth Vijnana is questionable. Educational research has consistently demonstrated that passive

listening results in retention rates of approximately 5–10% after 24 hours, compared to 50–90% for active learning modalities including discussion, practice, and peer teaching[15].

A content analysis of Padarth Vijnana textbooks commonly prescribed in Indian Ayurvedic institutions reveals a predominantly descriptive approach, with limited use of clinical examples, case illustrations, or application-oriented exercises[16]. The textbooks tend to present Padarthas as isolated categories rather than as an integrated system of thought with direct clinical implications, thereby reinforcing a compartmentalised understanding among students.

Assessment Practices

Assessment in Padarth Vijnana has traditionally been summative, with university examinations emphasising long-answer and short-answer questions that can be addressed through memorised textbook content[5]. The alignment between assessment tasks and higher-order learning objectives—such as the ability to apply Padartha categories to clinical scenarios, analyse disease pathology through the lens of Dravya-Guna-Karma theory, or evaluate competing interpretations of classical texts—remains weak. This assessment-instruction misalignment perpetuates a surface approach to learning, where students prioritise examination preparation over genuine conceptual understanding[17].

Identified Pedagogical Gaps

The literature identifies several critical gaps in current Padarth Vijnana pedagogy. First, there is an absence of structured clinical correlation: students learn philosophical categories in isolation from their therapeutic application, resulting in a failure to appreciate the clinical relevance of foundational concepts[6,18]. Second, the Sanskrit-heavy content creates a linguistic barrier for students whose medium of prior education was not Sanskrit, yet no structured Sanskrit scaffolding is embedded in the pedagogical approach[19]. Third, the lack of formative assessment mechanisms means that misconceptions go unidentified and uncorrected until summative examinations. Fourth, there is minimal use of visual, experiential, or technology-enhanced learning tools that could make abstract philosophical content more accessible[20]. Finally, faculty development in modern pedagogical methods specific to Ayurvedic foundational subjects remains severely underdeveloped[21].

THEORETICAL FOUNDATIONS FOR THE PROPOSED FRAMEWORK

Constructivist Learning Theory

The constructivist paradigm, articulated through the work of Piaget, Vygotsky, and Bruner, posits that learners actively construct knowledge through interaction with their environment, prior experiences, and social context rather than passively receiving transmitted information[22,23]. This theoretical orientation is particularly relevant to Padarth Vijnana pedagogy, where students must construct meaning from abstract philosophical categories by relating them to observable

phenomena and clinical experiences.

Vygotsky's concept of the Zone of Proximal Development (ZPD) offers a compelling framework for structuring Padarth Vijnana instruction: students are guided from their existing understanding (typically grounded in modern science from pre-university education) toward the target understanding (classical Ayurvedic ontological categories) through carefully calibrated scaffolding[23]. The teacher's role shifts from information transmitter to cognitive facilitator, designing learning experiences that progressively challenge students to integrate new conceptual frameworks with existing knowledge structures.

Bloom's Revised Taxonomy

Bloom's revised taxonomy of cognitive processes—Remember, Understand, Apply, Analyse, Evaluate, and Create—provides a hierarchical structure for organising learning objectives and designing aligned instructional activities and assessments[24]. The application of this taxonomy to Padarth Vijnana enables the systematic progression from basic recall of Padartha definitions (Remember) through comprehension of inter-categorical relationships (Understand), application of Dravya-Guna-Karma principles to clinical scenarios (Apply), analysis of disease pathology through multiple Padartha lenses (Analyse), critical evaluation of commentatorial interpretations (Evaluate), to the synthesis of original clinical correlations and research hypotheses (Create)[25].

Experiential Learning Theory

Kolb's experiential learning cycle—comprising concrete experience, reflective observation, abstract conceptualisation, and active experimentation—provides a valuable pedagogical model for Padarth Vijnana[26]. The experiential cycle can be operationalised through structured clinical observation sessions where students observe Ayurvedic consultations (concrete experience), reflect on the Padartha categories observed in practice (reflective observation), connect observations to theoretical frameworks from the textbook (abstract conceptualisation), and subsequently apply these frameworks to new clinical scenarios or case studies (active experimentation).

Andragogy and Adult Learning Principles

Knowles' principles of adult learning emphasise self-direction, experience-based learning, readiness to learn driven by relevance, and problem-centred orientation[27]. BAMS students, as adult learners entering a professional programme, are likely to be more motivated and engaged when the clinical and professional relevance of abstract Padartha categories is made explicit from the outset. This principle argues strongly for early and sustained clinical correlation in Padarth Vijnana instruction.

THE PROPOSED PEDAGOGICAL FRAMEWORK

Framework Architecture

The proposed Integrated Pedagogical Framework for Padarth Vijnana (IPFPV) is structured around five interconnected domains: (a) Content Organisation

Domain, which restructures the syllabus into thematic learning modules with explicit inter-topic linkages; (b) Instructional Strategy Domain, which specifies a diversified repertoire of teaching-learning methods mapped to learning objectives at each Bloom's taxonomy level; (c) Clinical Correlation Domain, which integrates structured clinical exposure from the first week of instruction; (d) Assessment Domain, which implements a balanced programme of formative and summative assessment aligned with defined competencies; and (e) Faculty Development Domain, which provides structured training in the pedagogical methods employed by the framework[28].

Content Organisation: Modular Thematic Approach

The IPFPV reorganises the Padarth Vijnana syllabus into eight thematic modules, each designed for 15–20 teaching hours. Module 1 (Pramana Vijnana) establishes the epistemological foundations, teaching students the methods of valid knowledge acquisition that underpin all subsequent learning. Module 2 (Padartha: The Categorical Framework) introduces the Shad Padarthas as an integrated system. Modules 3–5 progressively deepen the study of Dravya, Guna, and Karma with continuous clinical correlation. Module 6 (Samanya-Vishesha Siddhanta) explicates the fundamental therapeutic principles. Module 7 (Panchamahabhuta and Tridosha) bridges philosophical categories with the physiological framework. Module 8 (Integration and Application) synthesises all prior learning through complex case analyses and research application[2,3].

Instructional Strategy Domain

The framework employs a blended instructional strategy mapped to Bloom's cognitive domains. At the Remember and Understand levels, structured lectures supplemented with concept maps, Sanskrit terminology glossaries, and multimedia presentations provide the foundational knowledge base. At the Apply and Analyse levels, case-based learning (CBL), problem-based learning (PBL), Socratic questioning, and think-pair-share activities engage students in active processing of conceptual material[29,30]. At the Evaluate and Create levels, critical commentary analysis, inter-school debate (comparing Vaisheshika, Nyaya, and Ayurvedic interpretations), and guided research projects challenge students to synthesise and generate original scholarly work.

A particularly innovative element of the framework is the "Padartha Clinical Rounds" protocol, wherein first-year students accompany senior clinical faculty on ward rounds with the specific objective of identifying and documenting the Padartha categories observed in patient assessment, diagnosis, and treatment selection. This structured early clinical exposure directly addresses the clinical correlation gap identified in the literature and operationalises the experiential learning cycle within the Padarth Vijnana curriculum[26,31].

Assessment Domain

The assessment strategy of the IPFPV is designed for constructive alignment between learning

objectives, instructional activities, and assessment tasks, following Biggs' model[32]. Formative assessment includes weekly concept quizzes (MCQ and short-answer), concept map submissions, reflective journal entries from clinical observation sessions, and peer-assessed presentations. Summative assessment comprises modular examinations with structured question papers mapping to specific Bloom's levels, Objective Structured Practical Examinations (OSPE) stations requiring application of Padartha categories to clinical vignettes, and a capstone integration assessment requiring students to construct a complete Padartha-based analysis of a clinical condition. This multi-modal assessment approach ensures that all cognitive levels are evaluated and that assessment drives learning toward higher-order thinking[17,25].

Faculty Development Domain

Recognising that pedagogical innovation is only as effective as the faculty implementing it, the IPFPV includes a structured Faculty Development Programme (FDP) comprising orientation workshops on constructivist pedagogy, training in CBL and PBL facilitation, assessment literacy modules covering formative assessment design and rubric development, and ongoing peer observation and mentoring[21,23]. The FDP employs a train-the-trainer model to ensure institutional sustainability and scalability.

FRAMEWORK VALIDATION: PROPOSED METHODOLOGY

Delphi Expert Consensus

Content validation of the IPFPV is recommended through a modified Delphi process involving a panel of 15–20 experts comprising Padarth Vijnana faculty, Ayurvedic clinicians, medical educationists, and Sanskrit scholars[34]. Three iterative rounds of structured questionnaires would assess the framework's content validity, pedagogical soundness, practical feasibility, and alignment with NCISM competency requirements. A consensus threshold of 80% agreement on a 5-point Likert scale is proposed for framework component retention.

Pilot Implementation and Mixed-Methods Evaluation

Pilot implementation at two to three Ayurvedic institutions, employing a quasi-experimental pre-post design with a control group receiving conventional instruction, is recommended. Quantitative outcomes include pre-post knowledge assessment scores (validated MCQ instruments), conceptual understanding measures (concept mapping rubrics), and student satisfaction questionnaires. Qualitative data collection through semi-structured interviews with students and faculty, focus group discussions, and classroom observation field notes would provide rich contextual data on the framework's implementation dynamics and emergent challenges[35,36].

Psychometric Validation of Assessment Instruments

The assessment instruments developed as part of the IPFPV require independent psychometric validation, including item analysis (difficulty index, discrimination index), reliability estimation (Cronbach's alpha for internal consistency, test-retest reliability for stability), and construct validity evaluation through factor analysis [37]. This ensures that the assessment tools embedded within the framework are measuring the intended competencies with acceptable accuracy and consistency.

DISCUSSION

The proposed IPFPV represents an attempt to bridge the documented gap between the philosophical richness of Padarth Vijnana content and the pedagogical poverty of its current delivery. The framework draws deliberately on established educational theories—constructivism, Bloom's taxonomy, experiential learning, and andragogy—that have been validated extensively in Western medical education but have seen limited application in the Ayurvedic educational context[7,8,22].

A critical strength of the proposed framework is its emphasis on clinical correlation from the earliest stages of instruction. The traditional approach of teaching Padarth Vijnana as a purely theoretical subject in the first year, with clinical application deferred to later years, creates a pedagogical vacuum that undermines student motivation and conceptual integration[6,18]. The "Padartha Clinical Rounds" protocol addresses this by providing structured early clinical exposure, operationalising the widely endorsed principle of early clinical contact in medical education[38].

The integration of concept mapping as both an instructional and assessment tool is supported by substantial evidence from science education research. Concept maps have been shown to enhance meaningful learning, reveal misconceptions, and promote integrative understanding of complex, multi-layered content domains—characteristics that describe Padarth Vijnana precisely[39]. The visual representation of relationships between Padarthas, Gunas, and their clinical applications through concept maps can make abstract philosophical content tangible and navigable for students.

The Sanskrit language barrier identified in the literature warrants specific pedagogical attention. The framework recommends the development of graded Sanskrit glossaries, audio pronunciation guides, and etymological deconstruction exercises that teach students to derive meaning from Sanskrit compound terms systematically rather than treating them as opaque jargon[19]. This approach aligns with research on disciplinary literacy in medical education, where mastery of specialised terminology is recognised as integral to conceptual understanding[40].

Several implementation challenges must be acknowledged. Faculty resistance to pedagogical change, particularly in traditional institutions, represents a significant barrier. The time and resource requirements for CBL and PBL preparation,

clinical coordination for first-year rounds, and faculty training exceed those of conventional lecture-based instruction[21,33]. Institutional commitment at the leadership level, coupled with faculty incentive structures that recognise teaching innovation, will be essential for successful implementation.

The framework also has implications for the ongoing curricular reform process under the NCISM. The 2020 NCISM Act mandated the transition to competency-based education across all recognised Indian systems of medicine[14]. The IPFPV offers a subject-specific operationalisation of this mandate, providing a concrete, evidence-informed model for how competency-based education can be implemented in a foundational Ayurvedic subject. Similar frameworks could be developed and validated for other first-year subjects including Rachana Sharira, Kriya Sharira, and Ayurveda Itihas.

The WHO Traditional Medicine Strategy 2014–2023, and its subsequent extensions, have emphasised the importance of quality assurance in traditional medicine education as a prerequisite for safe and effective practice[41]. The IPFPV, with its structured content organisation, evidence-based instructional strategies, multi-modal assessment, and built-in quality assurance through validation, aligns with this international policy emphasis and may serve as a model for pedagogical reform in traditional medicine education globally.

LIMITATIONS

This review has several limitations that should be noted. First, the peer-reviewed literature on Padarth Vijnana-specific pedagogy is limited, and many insights have been drawn from the broader medical education and science education literature, necessitating contextual interpretation. Second, the proposed framework is theoretical and has not yet been empirically validated; the validation methodology outlined requires prospective implementation. Third, the review predominantly draws upon literature from Indian Ayurvedic institutions, and generalisability to Ayurvedic educational contexts in other countries (Nepal, Sri Lanka, Bangladesh) requires further investigation. Fourth, the cost-effectiveness of the proposed multi-modal pedagogical approach compared to conventional lecture-based instruction has not been formally evaluated.

FUTURE DIRECTIONS

Future work should prioritise the empirical validation of the IPFPV through rigorous multi-centre controlled studies. The development of a standardised, psychometrically validated assessment instrument bank for Padarth Vijnana, calibrated to Bloom's taxonomy levels, would serve both research and pedagogical purposes. Exploration of technology-enhanced learning tools, including virtual reality simulations of Panchamahabhuta interactions, artificial intelligence-powered adaptive learning platforms for Padartha concept mastery, and gamified learning modules, represents a promising frontier[20,42]. Longitudinal studies tracking the impact

of reformed Padarth Vijnana pedagogy on clinical reasoning skills in later professional years would provide the strongest evidence for the framework's effectiveness.

CONCLUSION

Padarth Vijnana occupies a position of singular philosophical importance within Ayurvedic education, yet its pedagogy has not kept pace with advances in educational science or the regulatory mandate for competency-based reform. The Integrated Pedagogical Framework proposed in this review offers a structured, theory-grounded, and practically implementable model for transforming Padarth Vijnana instruction from a predominantly passive, lecture-based experience into an active, clinically correlated, and cognitively demanding educational programme. The framework's validation through Delphi consensus, pilot implementation, and mixed-methods evaluation will be essential to establish its efficacy and refine its components. As Ayurvedic education enters an era of increasing accountability and global engagement, the development of subject-specific pedagogical frameworks represents a necessary and urgent scholarly agenda.

CONFLICT OF INTEREST

The author(s) declare no conflict of interest.

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