

A Proportional Model of Pre-Service Teacher Education

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Abstract

Pre-service Teacher Education stands at the confluence of disciplinary knowledge, pedagogical skill, and human development. Despite growing scholarly attention, a coherent proportional framework that integrates the three foundational domains of teacher preparation — knowledge, human development, and competency — remains elusive in Indian and global educational discourse. This paper proposes and examines a Proportional Model of Pre-Service Teacher Education grounded in Taxonomy of Teacher Education Taxonomy of Teacher Education, which delineates three interrelated domains: the Knowledge Base Domain, the Human Development Domain, and the Competency-Based Domain. The model aligns these domains with (Bhattacharyya, Taxonomy of Teacher Education, 2024) Bloom's three-dimensional taxonomy of educational objectives — Cognitive, Affective, and Psychomotor; the Tridimensional Model of Learning structured along Academic, Experiential, and Skill axes in a 1:2:3 ratio embedded within India's National Credit Framework (NCrF, UGC 2024); and the three canonical transactional approaches of pre-service Teacher Education — Expository, Collaborative, and Experiential Learning. The paper further contextualises the model within the UNESCO framework for quality pre-service teacher training, encompassing six dimensions of good policy and practice: the policy environment, models of curriculum reform, capacity-building for teacher trainers, quality assurance and evaluation, and supportive partnerships. Drawing on India's Integrated Teacher Education Programme (ITEP) under NEP 2020 as the applied case, the study employs a qualitative analytical methodology integrating documentary analysis and conceptual synthesis. The paper establishes that effective pre-service Teacher Education demands a proportional, integrated architecture in which knowledge, human development, and competency are cultivated simultaneously and in structured relationship with each other — and in which the three transactional approaches are deliberately aligned with their corresponding domains and phases.

Keywords: Pre-service Teacher Education; Taxonomy of Teacher Education; Proportional Model; Bloom's Educational Objectives; Tridimensional Learning; Academic Axis; Skill Axis; Experiential Axis; Transactional Approaches; Expository Learning; Collaborative Learning; Experiential Learning; UNESCO Teacher Training; ITEP; NEP 2020; NCrF; Behaviouristic Model; Competency-Based Model; Inquiry-Oriented Model

1. Introduction

Teacher Education is widely recognised as the keystone of educational quality. The professional preparation of teachers before they enter the classroom — commonly termed pre-service Teacher Education — shapes the foundational competencies, attitudes, and knowledge that determine the quality of teaching-learning interactions for decades to come. Despite this recognition, pre-service Teacher Education in many countries, including India, has historically suffered from structural imbalances: programmes that privilege theoretical knowledge delivery over the cultivation of practical competence and human sensibility, or conversely, that reduce professional preparation to skill-training at the cost of intellectual depth.

The present paper addresses this structural imbalance by proposing a Proportional Model of Pre-Service Teacher Education — a conceptual framework that assigns deliberate proportional weight to three interdependent domains of teacher preparation. The model draws upon Taxonomy of Teacher Education Taxonomy of Teacher Education (comprising the Knowledge Base Domain, the Human Development Domain, and the Competency-Based Domain) as its primary organisational scaffold, and integrates this taxonomy with three converging theoretical frameworks: Bloom's Educational Objectives (Cognitive, Affective, and Psychomotor domains), the Tridimensional Model of Learning (Academic, Experiential, and Skill axes in a 1:2:3 ratio from India's National Credit Framework), and the three principal transactional approaches in pre-service education (Expository, Collaborative, and Experiential Learning).

The paper situates this model within the UNESCO framework for quality pre-service teacher training — addressing the policy environment, models of curriculum reform, capacity-building, quality assurance and monitoring, and supportive partnerships — and examines its applied instantiation in India's Integrated Teacher Education Programme (ITEP), the flagship reform of the National Education Policy 2020.

The overarching argument is that effective pre-service Teacher Education cannot be achieved through any single-domain approach. Rather, it demands a proportional, integrated architecture in which knowledge, human development, and competency are cultivated simultaneously and in structured relationship with each other — and in which the methods of delivery (expository, collaborative, and experiential) are themselves aligned with the domain being developed.

2. Background of the Study

The landscape of pre-service Teacher Education has undergone significant transformation over the past three decades. Globalisation, technological advancement, shifting demographic realities, and the increasing demands of inclusive education have collectively placed unprecedented demands on teachers and, by extension, on the institutions charged with preparing them. Historically, teacher training in many countries was delivered through stand-alone teacher training colleges or normal schools with relatively narrow mandates and limited research orientation. Over time, the integration of Teacher Education into universities broadened its intellectual scope but also introduced new tensions between theoretical and practical emphases.

Globally, UNESCO, the World Bank, the OECD, and various regional bodies have increasingly recognised teacher quality as a linchpin of education system performance. The Education for All (EFA)

movement, the Millennium Development Goals, and the Sustainable Development Goals — particularly SDG 4, which calls for inclusive and equitable quality education — have all foregrounded the centrality of qualified, well-prepared teachers. SDG 4.c specifically calls on nations to substantially increase the supply of qualified teachers through international cooperation in teacher training by 2030.

The academic landscape of Teacher Education has been shaped by three dominant models: the Behaviouristic Teacher education model, which prioritises the systematic acquisition and demonstration of specific teaching behaviours; the Competency-Based Teacher Education model, which organises preparation around measurable professional competencies; and the Inquiry-Oriented Teacher Education Model, which positions the teacher as a reflective practitioner, researcher, and intellectual agent. Each of these models captures something essential, yet each, taken in isolation, remains partial.

In India, the National Education Policy 2020 has catalysed a significant transformation in Teacher Education through the Integrated Teacher Education Programme (ITEP) — a four-year dual-major undergraduate programme designed to replace the fragmented one-year B.Ed. model. Taxonomy of Teacher Education that reframes Bloom's classical educational objectives into a domain-specific architecture suited to the unique professional and relational demands of teacher preparation. This taxonomy identifies three foundational domains: the Knowledge Base Domain (corresponding to Bloom's Cognitive Domain), the Human Development Domain (corresponding to the Affective Domain), and the Competency-Based Domain (corresponding to the Psychomotor Domain).

Simultaneously, India's National Credit Framework (NCrF, UGC 2024) articulates learning along three interdependent axes — the Academic Axis (content-based), the Skill Axis (ability to perform), and the Experiential Axis (proficiency built through experience) — proposing a credit weighting of 1:2:3 that fundamentally shifts emphasis from passive knowledge reception to active experiential engagement. The convergence of these frameworks offers an unprecedented opportunity to construct a theoretically grounded and practically viable proportional model of pre-service Teacher Education — one that specifies not just what to teach, but how, in what proportion, in what sequence, and with what relative emphasis across the formative phases of a teacher's professional development.

3. Research Questions

This study is guided by the following research questions:

- RQ1: How do Taxonomy of Teacher Education, taxonomy of Educational Objectives, and the NCrF Tridimensional Model converge to provide a structural basis for the Proportional Model of pre-service Teacher Education?
- RQ2: What is the appropriate proportional weighting and sequential emphasis of the Knowledge Base Domain, Human Development Domain, and Competency-Based Domain across the phases of a pre-service Teacher Education programme?
- RQ3: How do the three principal transactional approaches — Expository, Collaborative, and Experiential Learning — correspond to the three domains of Taxonomy of Teacher Education Taxonomy and function as pedagogical instruments within each phase of the proportional model?
- RQ4: How do the three Models of Teacher Education — Behaviouristic, Competency-Based, and Inquiry-Oriented — map onto the proportional structure?

- RQ5: What are the key UNESCO principles and frameworks for quality pre-service teacher training, and how do they validate and supplement the proposed Proportional Model?

4. Review of Related Studies

The following tables present the review of related literature organized from the most recent to the oldest.

Sl. No.	Title	Year	Authors / Agency	Research Methodology	Aims and Objectives	Findings
1	Implementation Phase of NEP 2020: An Outcome-Based Approach	2026	Bhattacharyya, D., & Halder, S.	Qualitative and Analytical	To examine the implementation strategies of NEP 2020 focusing on outcome-based education.	Emphasizes the shift from input-based to output-based education, highlighting the need for structural changes in assessment.
2	Integrated Teacher Education Programme Through Componential Flexible Curriculum...	2025	Bhattacharyya, D., & Halder, S.	Descriptive and Framework Analysis	To propose a flexible curriculum model for ITEP aligned with the Tri-Dimensional NCrF model.	Found that a componential approach allows for better credit transfer and multidisciplinary learning paths.
3	SOPs for Operationalisation of National Credit Framework (NCrF)	2024	University Grants Commission (UGC)	Policy Analysis	To provide standard operating procedures for credit assignment in higher education.	Establishes the 30-hour work per credit norm and the mechanism for the Academic Bank of Credits (ABC).

Sl. No.	Title	Year	Authors / Agency	Research Methodology	Aims and Objectives	Findings
4	Taxonomy of Teacher Education (Seminar Volume)	2024	Bhattacharyya, D.	Synthesis of Literature	To categorize the various dimensions and standards of modern teacher education.	Identifies excellence versus reality gaps in current training modules and suggests a revised taxonomy.
5	Towards a New Model of Pre-Service & In-Service Teacher Education	2024	Bhattacharyya, D.	Qualitative Analysis	To develop a unified model for continuous teacher professional development.	Suggests that bridging the gap between pre-service theory and in-service practice is vital for professional growth.
6	Taxonomy of Teacher Education: Excellence vs. Reality	2023	Bhattacharyya, D.	Comparative Study	To evaluate the effectiveness of current teacher education against global excellence standards.	Highlights significant discrepancies between the intended curriculum and the actual classroom outcomes.
7	Digital Transformation and Social Structure	2023	TRAI; Banaji & Bhat	Secondary Data Analysis	To analyze the impact of digital growth on Indian social hierarchies and community interaction.	Digital platforms mirror existing social hierarchies but create new spaces for interest-based

Sl. No.	Title	Year	Authors / Agency	Research Methodology	Aims and Objectives	Findings
						community networking.
8	National Education Policy 2020	2020	Government of India	Policy Review	To overhaul the Indian education system from school to higher education.	Recommended a 5+3+3+4 structure and the introduction of multidisciplinary education with multiple entry/exit points.
9	Effective Teacher Professional Development	2017	Darling-Hammond, L., Hyler, M. E., & Gardner, M.	Meta-analysis of research	To identify the characteristics of professional development that lead to improved student learning.	Effective PD is content-focused, incorporates active learning, and supports collaboration in job-embedded contexts.

Table 1 Tables of review of related literature

4.1 Taxonomy of Teacher Education Taxonomy of Teacher Education

Taxonomy of Teacher Education Taxonomy of Teacher Education represents a foundational three-domain conceptualisation of what teachers need to become through pre-service preparation. The taxonomy identifies three domains that are distinct yet deeply interdependent: the Knowledge Base Domain (encompassing the theoretical and academic knowledge teachers require to understand education as a field of inquiry and their subject matter as a body of knowledge); the Human Development Domain (addressing the affective, relational, ethical, and social dimensions of teacher development); and the Competency-Based Domain (addressing the practical teaching competencies, skills, and professional capacities that teachers must develop to be effective in classrooms). Critically, Taxonomy of Teacher Education taxonomy represents a landmark reframing of Bloom's classical taxonomy — replacing its general educational objectives with domain-specific professional architecture suited to the unique demands of teacher preparation. The Knowledge Base Domain replaces Bloom's Cognitive Domain; the Human Development Domain replaces the Affective Domain; and the Competency-Based Domain replaces the Psychomotor Domain.

4.2 Bloom's Taxonomy of Educational Objectives

Bloom's Taxonomy of Educational Objectives (1956, revised by Anderson and Krathwohl, 2001) has served as the foundational organising framework for curriculum development in Teacher Education for over six decades. The taxonomy's tripartite structure — the Cognitive Domain (remembering, understanding, applying, analysing, evaluating, creating), the Affective Domain (receiving, responding, valuing, organising, characterising values), and the Psychomotor Domain (perception, set, guided response, mechanism, complex overt response, adaptation, origination) — maps naturally onto the intellectual, dispositional, and practical dimensions of teacher preparation. Taxonomy of Teacher Education innovation lies in recognising that these generic educational domains require domain-specific reinterpretation when applied to the professional preparation of teachers, whose learning context, prior knowledge, and developmental needs differ fundamentally from those of general student learners.

4.3 The NCrF Tridimensional Model of Learning

India's National Credit Framework (NCrF, UGC 2024) introduces a three-dimensional credit architecture through which academic learning (Academic Axis — X-axis), practical skill development (Skill Axis — Y-axis), and experiential proficiency (Experiential Learning Proficiency Axis — Z-axis) are recognised in an integrated credit system. The proposed ratio of 1 (Academic) : 2 (Skill) : 3 (Experiential) represents a paradigm shift away from lecture-dominated teacher preparation toward experientially rich, competency-building professional formation. The Experiential Axis classifies proficiency into four progressive levels — Trained, Proficient, Expert, and Master — reflecting increasing mastery of skills and knowledge acquired through practice rather than formal instruction. This ratio directly aligns with the proportional emphasis recommended in Taxonomy of Teacher Education taxonomy and finds concrete institutional expression in the credit distribution of the ITEP.

4.4 Transactional Approaches in Teacher Education

Transactional approaches in education refer to the instructional methods and strategies through which knowledge, skills, and attitudes are transmitted and constructed between the teacher educator and the student-teacher. Three major transactional approaches are widely recognised in pre-service Teacher Education: Expository Learning, Collaborative Learning, and Experiential Learning. Expository Learning is grounded in Ausubel's (1963) theory of Meaningful Verbal Learning and operates primarily on the Academic Axis, developing the Knowledge Base Domain through lectures, demonstrations, assigned readings, and multimedia. Collaborative Learning is rooted in Vygotsky's (1978) social constructivism and Dewey's philosophy of democratic education, operating primarily on the Skill Axis, developing the Competency-Based Domain through cooperative groups, peer teaching, seminars, PBL, microteaching, and role-play. Experiential Learning is grounded in Kolb's (1984) Experiential Learning Cycle and Schon's (1983) concept of the Reflective Practitioner, operating primarily on the Experiential Axis, developing the Human Development Domain through teaching practice, reflective journals, portfolios, and community engagement.

4.5 Models of Teacher Education

Three major models of Teacher Education have been identified in the literature. The Behaviouristic Model, drawing on principles of stimulus-response learning, focuses on observable teaching behaviours

and their systematic modification through training, feedback, and practice (Joyce & Showers, 2002). It finds its primary purchase in the Knowledge Base Domain, where systematic, structured instruction lays the behavioural foundations of professional practice. The Competency-Based Model defines teacher effectiveness in terms of demonstrable competencies aligned with predetermined standards (Darling-Hammond, 2006), operating most effectively in the Competency-Based Domain through collaborative and practical learning activities. The Inquiry-Oriented Model, rooted in Dewey's philosophy of education as reflective experience, positions the teacher as a critical inquirer who problematises practice and uses evidence to improve teaching (Zeichner & Liston, 1996), finding its expression primarily in the Human Development Domain through experiential learning, action research, and reflective practice.

4.6 UNESCO Framework for Pre-Service Teacher Training

UNESCO's Good Policy and Practice framework for Teacher Education identifies six cross-cutting dimensions of effective pre-service teacher training. The first dimension concerns good policy and practice — specifically, a clear, shared vision of what effective teachers need to know, be, and do. The second addresses the policy environment, encompassing regulatory frameworks, accreditation standards, governance structures, and funding mechanisms. The third concerns models of curriculum reform, including the shift from subject-based to competency-based curricula, the integration of spiral theory–practice cycles, and the development of participatory, evidence-based reform processes. The fourth addresses capacity-building and support for teacher trainers — a 'doubly invisible' group that UNESCO identifies as a critical input variable. The fifth concerns quality assurance, evaluation, and monitoring through multi-level QA systems moving beyond compliance-oriented input monitoring toward outcome-focused evaluation. The sixth emphasises supportive partnerships, particularly school–university partnerships (SUPs) as the primary vehicle for authentic experiential learning.

5. Research Gaps

Despite the richness of existing scholarship on pre-service Teacher Education, several significant theoretical and empirical gaps persist that this study seeks to address:

- **Absence of an Integrated Proportional Framework:** Existing models of Teacher Education (Behaviouristic, Competency-Based, Inquiry-Oriented) are typically presented as alternatives rather than complements. No prior integrated proportional model has explicitly addressed the weighted relationship among the three domains of Taxonomy of Teacher Education taxonomy, simultaneously mapping them onto Bloom's objectives, the NCrf axes, the three transactional approaches, and the three Teacher Education Models.
- **Under theorisation of the Human Development Domain:** The affective, social, and ethical dimensions of teacher development — corresponding to Bloom's Affective Domain, Taxonomy of Teacher Education Human Development Domain, and the Experiential Learning Axis — are consistently under theorised and underrepresented in curriculum design relative to the cognitive and competency dimensions.

- Disconnect between Taxonomic and Transactional Approaches: The structural relationship between Taxonomy of Teacher Education three domains and the three transactional approaches of pre-service education has not been systematically mapped or theorised in the literature.
- Limited Integration of UNESCO Frameworks with Indian Teacher Education Models: Indian scholarship on Teacher Education models has not been systematically integrated with UNESCO's policy principles, creating a gap between global good practice and national reform initiatives such as ITEP.
- Insufficient Evaluation of ITEP's Proportionality: While the ITEP has been extensively described in policy documents, empirical and analytical assessment of whether it achieves proportional coverage of knowledge, human development, and competency domains remains limited.

6. Methodology of the Study

This study employs a Qualitative Documentary Analysis (QDA) methodology, a systematic procedure for reviewing and evaluating documents — both printed and electronic — to elicit meaning, gain understanding, and develop empirical knowledge and conceptual synthesis. As a theoretical paper proposing a normative model of pre-service Teacher Education, it does not employ primary data collection through fieldwork or experimentation. Instead, it draws on: (1) systematic analysis of primary documents including NCTE policy documents, NEP 2020, UGC NCrF Guidelines 2024, and UNESCO Teacher Policy frameworks; (2) secondary literature including peer-reviewed articles and scholarly books on Teacher Education models, Bloom's taxonomy, experiential learning theory, and collaborative learning; and (3) the primary theoretical frameworks and ITEP.

The conceptual synthesis methodology follows the tradition of theoretical model-building in educational research, whereby disparate but related theoretical frameworks are integrated into a coherent new framework that offers analytical and practical advantages over any single framework in isolation. The study proceeds through five analytical steps: (1) identification and explication of each constituent framework; (2) analysis of structural correspondences among frameworks; (3) synthesis into an integrated proportional model; (4) application of the model to the ITEP case; and (5) derivation of implications for policy and practice.

The analysis proceeds through three stages: first, identification of convergent structures across all four frameworks (Bhattacharyya, Bloom, NCrF, UNESCO); second, construction of the proportional model through phase-mapping and weighting analysis; and third, validation through UNESCO's dimensions of good policy and practice. No primary quantitative data was collected; the study is fundamentally interpretive and theoretical in nature, drawing its empirical grounding from the documentary evidence of the ITEP framework.

7. Analysis and interpretation

Convergence of Taxonomy of Teacher Education, Bloom's Educational Objectives, and the NCrF Tridimensional Model

A careful analysis of all three frameworks reveals a remarkably coherent convergence, despite the distinct contexts and purposes from which they emerged. Taxonomy of Teacher Education identifies three professional domains for teacher preparation; Bloom's Taxonomy identifies three dimensions of educational objectives; and the NCrF Tridimensional Model identifies three axes of learning, each with a specific credit weight. The structural isomorphism among these three frameworks is the foundational finding of this paper.

The Knowledge Base Domain corresponds precisely to the Cognitive Domain (Bloom) and the Academic Axis (NCrF weight: 1). It is the domain of knowing — of theoretical, disciplinary, and pedagogical knowledge. The appropriate transactional approach for this domain is Expository Learning, which systematically organises and presents structured knowledge to student-teachers. The Teacher Education model most associated with this domain is the Behaviouristic Model, in which systematic, structured instruction establishes the behavioural foundations of professional practice.

The Human Development Domain corresponds to the Affective Domain (Bloom) and the Experiential Axis (NCrF weight: 2). It is the domain of being — of values, empathy, emotional intelligence, professional identity, and relational capacity. The appropriate transactional approach is Experiential Learning, which develops professional identity and affective sensibility through direct, hands-on experience followed by structured reflection. The Teacher Education model most associated with this domain is the Inquiry-Oriented Model, which positions the teacher as a reflective practitioner who continuously examines and reconstructs their professional self.

The Competency-Based Domain corresponds to the Psychomotor Domain (Bloom) and the Skill Axis (NCrF weight: 3). It is the domain of doing — of practical teaching skills, classroom management, assessment design, and professional competencies. The appropriate transactional approach is Collaborative Learning, through which student-teachers develop competencies in socially embedded, peer-supported learning contexts. The Teacher Education model most associated with this domain is the Competency-Based Model, which defines and assesses specific measurable teaching competencies.

DOMAIN	BLOOM'S OBJECTIVE	NCrF AXIS & WEIGHT	TRANSACTIONAL APPROACH	TEACHER EDUCATION MODEL	PHASE
Knowledge Base Domain	Cognitive Domain	Academic Axis ×1	Expository Learning	<i>Behaviouristic Model</i>	Phase 1
Competency-Based Domain	Psychomotor Domain	Skill Axis ×3	Collaborative Learning	<i>Competency-Based Model</i>	Phase 2

Human Development Domain	Affective Domain	Experiential Axis ×2	Experiential Learning	<i>Inquiry-Oriented Model</i>	Phase 3 (Sustained)
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Table 2: Structural correspondence among Taxonomy of Teacher Education Taxonomy, Bloom's Objectives, NCeF Tridimensional Model, Transactional Approaches, Teacher Education Models, and Programme Phases

The alignment demonstrated in Table 1 establishes the theoretical foundation of the Proportional Model. Each row represents a complete, coherent axis of teacher development — from knowing to being to doing — with each framework contributing a distinct but convergent perspective on the same fundamental architecture.

Proportional Weighting and Sequential Phases

The Proportional Model of Pre-Service Teacher Education operates through three sequentially interdependent phases, each with a specific emphasis and proportional priority. The sequence is not arbitrary but follows the developmental logic of professional formation: pre-service teacher candidates arrive at training institutions without professional experience and without the cognitive substrate required for sophisticated pedagogical reasoning. The imperative is therefore to build first, before expecting performance.

ITEP CURRICULAR COMPONENT	CREDITS
Student Induction Programme (Common to all student-teachers across stage specific specialisation. To be organised during the first two weeks of Semester-1)	
Foundations of Education	30
Disciplinary/Interdisciplinary	64
Stage-Specific Pedagogy	16
Ability Enhancement Courses	28
School Experience (Internship etc)	20
Community Engagement & Service	2
TOTAL	<i>4 Years - 8 Semesters - NEP 2020 - ITEP Credits 160</i>

Phase 1 — Knowledge Acquisition — prioritises the intensive acquisition of academic and theoretical knowledge, establishing the indispensable cognitive substrate required for pedagogical reasoning. Institutions must ensure thorough content coverage across all eleven knowledge dimensions of Taxonomy of Teacher Education

taxonomy: Foundational, Transactional, Pedagogical Content Knowledge (PCK), Practical, Ethical, Experiential, Aesthetic, Analytical, Critical, Innovative, and Integral Knowledge. Without this foundation, competency development risks being superficial and theoretically unanchored.

Phase 2 — Competency Development — deliberately underemphasises immediate competency execution relative to theoretical grounding. Rather than demanding high-level professional performance, it focuses on the gradual, scaffolded translation of theory into observable practice through guided experimentation, supervised microteaching, peer observation, and reflective practice. The eleven competency dimensions — Innovative, Reflective, Evaluation, Epistemological, Technological, Management, Collaborative, Pedagogical, Curricular, Behavioural, and Social Competency — are developed progressively under expert supervision.

Phase 3 — Human Development — maintains a high and sustained emphasis throughout the entire programme, not merely in the final phase. The educator's self-concept, emotional intelligence, empathy, resilience, values, and interpersonal skills are not an add-on but the connective tissue that makes knowledge meaningful and competency transformative. The eleven human dimensions — Self-Concept, Emotional Awareness, Social Development, Values and Beliefs, Commitment, Resilience, Empathy, Interpersonal Skills, Adaptability, Motivation, and Mindfulness — must be cultivated throughout all phases.

DIMENSION	PHASE 1 <i>Knowledge Acquisition</i>	PHASE 2 <i>Competency Development</i>	PHASE 3 <i>Human Development (Sustained)</i>	PRIORITY / RATIONALE
Taxonomy of Teacher Education Domain	Knowledge Base Domain	Competency-Based Domain	Human Development Domain	<i>Sequential → Sustained</i>
Bloom's Taxonomy	Cognitive Domain	Psychomotor Domain	Affective Domain	<i>Build → Apply → Internalise</i>
NCrF Axis & Weight	Academic ×1	Skill ×3	Experiential ×2	<i>1 : 3 : 2 (within phase sequence)</i>
Transactional Approach	Expository Learning	Collaborative Learning	Experiential Learning	<i>Direct → Social → Reflective</i>
Teacher Education Model	Behaviouristic Model	Competency-Based Model	Inquiry-Oriented Model	<i>Systematic → Measurable → Reflective</i>

Priority Level	PRIORITIZE	UNDEREMPHASIZE (Scaffolded)	MAINTAIN HIGH EMPHASIS (Throughout)	<i>Foundation</i> → <i>Practice</i> → <i>Identity</i>
ITEP Credits (of 160)	30 + 64 = 94 credits (Foundations + Disciplinary)	16 + 28 = 44 credits (Pedagogy + Enhancement)	20 + 2 = 22 credits (School Exp + Community)	94 : 44 : 22 = 4 : 2 : 1
Assessment Tools	Tests, Examinations, Quizzes, Assignments	Group Tasks, Peer Assessment, Microteaching Evaluation	Portfolio, Practicum Reports, Reflective Journals	<i>Formative</i> + <i>Summative</i> + <i>Impact</i>

Table 3: Phase-wise mapping of domains, Bloom's taxonomy, NCrf axes, transactional approaches, Teacher Education models, priorities, and ITEP credit distribution

1	2	3
KNOWLEDGE BASE Academic Axis Expository Learning Cognitive Domain	HUMAN DEVELOPMENT Experiential Axis Collaborative Learning Affective Domain	COMPETENCY-BASED Skill Axis Experiential Learning Psychomotor Domain
Behaviouristic Teacher Education Model · Phase 1	Inquiry-Oriented Teacher Education Model · Phase 3 (Sustained)	Competency-Based Teacher Education Model · Phase 2

Table 4: The NCrf 1:2:3 ratio bar showing Knowledge Base (×1), Human Development (×2), and Competency-Based (×3) weightings with corresponding domains, approaches, and Teacher Education models

Transactional Approaches as Pedagogical Instruments

Expository Learning and the Knowledge Base Domain (Phase 1)

Expository Learning, rooted in Ausubel's (1963) theory of Meaningful Verbal Learning and advance organisers, is the appropriate primary approach for developing the Knowledge Base Domain. In this approach, the teacher educator presents organised, sequenced knowledge to student-teachers through lectures (formal, interactive, illustrated, demonstration), demonstrations, assigned readings, and multimedia. The Knowledge Base Domain encompasses educational foundations (philosophy, history, psychology, sociology of education), disciplinary content knowledge, and curriculum theory — all areas where systematic, teacher-directed exposition of organised knowledge structures is both efficient and essential. The Behaviouristic Teacher Education Model, with its emphasis on systematic transmission of

professional behaviours, operationalises this phase. Expository methods must be carefully designed with advance organisers to activate prior knowledge, targeted questioning to stimulate cognitive engagement, and rich analogies and illustrations to bridge abstract theory with emerging professional understanding.

Collaborative Learning and the Competency-Based Domain (Phase 2)

Collaborative Learning, grounded in Vygotsky's (1978) social constructivism and Dewey's (1938) philosophy of education as a democratic and social process, is the appropriate primary approach for developing the Competency-Based Domain. Through group-based learning activities — cooperative learning groups, peer teaching, seminars, Problem-Based Learning (PBL), the Jigsaw technique, role-play and simulation, and microteaching — student-teachers develop the practical teaching competencies that constitute professional effectiveness. Microteaching deserves special attention as a specifically designed collaborative technique for developing the psychomotor dimension of teaching competence through deliberate practice of specific teaching skills (set induction, questioning, reinforcement, stimulus variation, and closure) in a controlled, feedback-rich environment. The Competency-Based Teacher Education Model operationalises this phase by defining measurable teaching competencies and assessing their development through structured observation and peer evaluation.

Experiential Learning and the Human Development Domain (Phase 3, Sustained Throughout)

Experiential Learning, grounded in Kolb's (1984) Experiential Learning Cycle (Concrete Experience → Reflective Observation → Abstract Conceptualisation → Active Experimentation) and Schon's (1983) concept of the Reflective Practitioner, is the appropriate primary approach for developing the Human Development Domain. The forms of experiential learning employed in pre-service Teacher Education include: Teaching Practice/Field Placement (the centrepiece), Reflective Journals and Portfolios, Community Service Learning, Educational Excursions, and Case Studies. Reflection is the engine of experiential learning: through Reflection-in-action (thinking on one's feet during a lesson), Reflection-on-action (reviewing a lesson after it has occurred), and Reflection-for-action (using insights from past experiences to plan future actions), student-teachers continuously examine and reconstruct their developing professional selves. The Inquiry-Oriented Teacher Education Model operationalises this phase by positioning the teacher as a critical researcher of their own practice.

DIMENSION	EXPOSITORY <i>Phase 1 · Ratio: 1 · Academic Axis</i>	COLLABORATIVE <i>Phase 2 · Ratio: 3 · Skill Axis</i>	EXPERIENTIAL <i>Phase 3 · Ratio: 2 · Experiential Axis</i>
Theoretical Basis	Ausubel (1963) — Meaningful Verbal Learning; Advance Organisers	Vygotsky (1978) — ZPD; Dewey (1938) — Democratic Education; Social Constructivism	Kolb (1984) — Experiential Learning Cycle; Schon (1983) — Reflective Practitioner

Taxonomy of Teacher Education Domain	Knowledge Base Domain	Competency-Based Domain	Human Development Domain
Bloom's Domain	Cognitive Domain (Knowing)	Psychomotor Domain (Doing)	Affective Domain (Being)
NCrF Axis & Weight	Academic Axis — Weight: 1 (Minimum)	Skill Axis — Weight: 3 (Maximum)	Experiential Axis — Weight: 2 (Moderate)
Teacher Education Model	Behaviouristic Teacher Education Model	Competency-Based Teacher Education Model	Inquiry-Oriented Teacher Education Model
Role of Learner	Structured receiver of organised knowledge; active cognitive engagement	Active co-constructor through social interaction and dialogue	Active doer, reflector, and professional identity-builder
Role of Educator	Presenter / Director / Knowledge Organiser (uses advance organisers)	Facilitator / Guide / Community-of-Practice Builder	Mentor / Supervisor / Critical Friend / Reflective Coach
Key Methods	Lectures (formal/interactive/illustrated), demonstrations, assigned readings, multimedia	Cooperative groups, peer teaching, seminars, PBL, jigsaw, role-play, microteaching	Teaching practice, reflective journals, portfolios, community service, case studies
ITEP Component	Foundations of Education; Disciplinary/Interdisciplinary Courses	Stage-Specific Pedagogy; Ability Enhancement Courses	School Experience; Community Engagement
Assessment Tools	Examinations, quizzes, tests, written assignments	Group tasks, presentations, peer assessment, microteaching evaluation	Practicum evaluation, portfolio, reflective reports, community project

Table 5: Comparative matrix of Expository, Collaborative, and Experiential Learning across all theoretical, methodological, and institutional dimensions

Mapping the Three Models of Teacher Education onto the Proportional Structure

The three established Models of Teacher Education — Behaviouristic, Competency-Based, and Inquiry-Oriented — are not mutually exclusive alternatives but sequentially integrated architectures within the proportional model. Their historical presentation as competing paradigms has been one of the primary sources of imbalance in pre-service programme design.

The Behaviouristic Teacher Education Model, operating in Phase 1, provides the systematic behavioural scaffolding through which foundational knowledge is transmitted and initial professional dispositions are established. Expository instruction, structured demonstrations, and behaviour modification through feedback are its primary instruments. The Competency-Based Teacher Education Model, operating in Phase 2, builds the professional skill architecture through collaborative, practice-oriented learning activities. The definition and measurement of specific teaching competencies provide the evaluative framework for this phase. The Inquiry-Oriented Teacher Education Model, operating in Phase 3 and sustained throughout the programme, deepens the reflective, human dimensions of teaching identity. Action research, reflective portfolios, and critical self-examination are its primary instruments.

The proportional model thus resolves the historical tension among these three orientations by repositioning them as sequential and complementary phases of a unified developmental trajectory: the Behaviouristic model establishes the foundation, the Competency-Based model constructs the professional edifice, and the Inquiry-Oriented model ensures that this edifice is inhabited by a reflective, humanly whole educator.

PRE-SERVICE MODEL (Knowledge Acquisition)	IN-SERVICE MODEL (Competency-Oriented)
Phase 1: PRIORITIZE Knowledge Acquisition	Phase 1: PRIORITIZE Competency Development
Phase 2: UNDEREMPHASIZE Competency (Scaffolded)	Phase 2: MINIMIZE Knowledge Acquisition (Updates only)
Phase 3: MAINTAIN HIGH EMPHASIS on Human Development	Phase 3: MAINTAIN HIGH EMPHASIS on Human Development
Learner Profile: No experience · Needs cognitive substrate first	Learner Profile: Experienced · Needs skill refinement first
Transactional Priority: Expository → Collaborative → Experiential	Transactional Priority: Collaborative → Experiential → Expository (targeted)
Teacher education Model Sequence: Behaviouristic → Competency → Inquiry	Teacher education Model Sequence: Inquiry → Competency → Behaviouristic (review)
NCrF Ratio Emphasis: Academic(1) → Skill(3) → Experiential(2)	NCrF Ratio Emphasis: Skill(3) → Experiential(2) → Academic(1 updates)

Core Principle: BUILD first — before expecting performance	Core Principle: REFINE — sharpen what already exists
Institutional Vehicle: ITEP (4 years, 160 credits, 8 semesters)	Institutional Vehicle: MMTTC, FIP, RC, FDP, Orientation Programmes

Table 6: Comparative architecture of the Pre-Service (Knowledge Acquisition) and In-Service (Competency-Oriented) phasing model

UNESCO's framework for quality pre-service teacher training — Validation of the Proportional Model

UNESCO's framework for quality pre-service teacher training, articulated across multiple policy documents including the Good Policy and Practice in HIV & AIDS and Education series (Booklet 6, 2011) and the Teacher Policy Development Guide (2015), provides a robust external validation architecture for the Proportional Model across six key dimensions.

Good Policy and Practice

Good policy and practice in pre-service Teacher Education begins with a clear conception of what effective teachers need to know, be, and do — the three dimensions corresponding precisely to Taxonomy of Teacher Education three domains (Knowledge Base, Human Development, Competency-Based). UNESCO emphasises that quality teacher preparation must address teacher supply, selection, preparation, induction, and continuing development within a coherent policy framework. The Proportional Model provides the conceptual architecture for such a framework by specifying the proportional weightings of all three dimensions of effective teacher preparation.

The Policy Environment

UNESCO recognises that Teacher Education institutions operate within enabling or constraining policy environments. A policy environment conducive to the Proportional Model would include: regulations governing Teacher Education programme length and credit distribution aligned with the 1:2:3 ratio; accreditation standards requiring evidence of balanced coverage across knowledge, human development, and competency domains; assessment frameworks that evaluate teacher candidates across all three domains; and career entry requirements that incentivise the development of all three domains. The ITEP framework, with its NCTE-mandated standards and NEP 2020 alignment, represents precisely such an enabling policy environment in India.

Models of Curriculum Reform

UNESCO identifies curriculum reform as central to teacher quality improvement. The Proportional Model provides a principled basis for evaluating curriculum reforms: does the reformed curriculum achieve a more appropriate proportional balance across the three domains? The shift from the one-year B.Ed. to the four-year ITEP in India exemplifies curriculum reform aimed at achieving greater proportionality — extending from approximately 80% Knowledge Base / 20% Practice to a more balanced tridimensional architecture. The ITEP's seven-component curricular structure — Student Induction,

Foundations of Education, Disciplinary Courses, Stage-Specific Pedagogy, Ability Enhancement, School Experience, and Community Engagement — embodies the standard-setting model of curriculum reform.

Capacity-Building and Support for Teacher Trainers

UNESCO emphasises that the quality of pre-service Teacher Education ultimately depends on the quality of teacher educators. Capacity-building for teacher educators must itself reflect the Proportional Model: teacher educators need deep knowledge bases (Knowledge Base Domain), rich experiential understanding of school contexts (Human Development Domain), and sophisticated pedagogical competencies in the full range of transactional approaches (Competency-Based Domain). The Proportional Model translates this into clear role differentiation across phases: Phase 1 educators function as Presenters/Organisers; Phase 2 educators as Facilitators/Guides; Phase 3 educators as Mentors/Supervisors.

Quality Assurance, Evaluation, and Monitoring

UNESCO calls for robust QA systems operating at multiple levels. The Proportional Model supports a multi-level evaluation architecture: Formative evaluation embedded within each phase (diagnostic assessment, peer feedback, supervisory observation, reflective journaling); Summative evaluation at the conclusion of each phase (written examinations, teaching practice evaluations, portfolio review); and Impact assessment tracking the long-term professional effectiveness of programme graduates. The ITEP's 10-point grading scale (minimum passing grade C = 5.0), combined with formative tools and summative instruments including the 10-credit internship evaluation, represents a QA system consistent with UNESCO's recommendations.

Supportive Partnerships

UNESCO emphasises that effective pre-service Teacher Education cannot be the exclusive responsibility of teacher training institutions operating in isolation. The Proportional Model operationalises the partnership principle through the School Experience component of ITEP: Pre-internship Practice (Semester 5), School Observation (Semester 6), School-Based Research Project (Semester 7), Internship in Teaching (Semester 7 — 10 credits), Post-Internship Review (Semester 8), and Community Engagement and Service (Semester 8). These components institutionalise all six dimensions of UNESCO's partnership framework — school–university collaboration, government engagement, community involvement, mentoring, co-teaching, and reflective supervision.

Sl. No.	UNESCO PILLAR	KEY UNESCO REQUIREMENTS	PROPORTIONAL MODEL ALIGNMENT
1	Policy & Practice	Clear vision of what teachers should know, be, do; coherent policy across all programme components; competency-based	Proportional Model specifies know (Knowledge Base Domain), be (Human Development Domain), do (Competency-Based Domain) — a

		frameworks articulating graduate standards.	tripartite architecture for comprehensive policy design.
2	Policy Environment	Regulatory frameworks for accreditation; conditions of employment; governance of university–school–government relationships; sustainable funding mechanisms for extended practicum.	ITEP's NCTE-mandated 160-credit structure, NEP 2020 alignment, and phase-specific credit allocation provide the regulatory basis for Proportional Model implementation.
3	Models of Curriculum Reform	Shift from subject-based to competency-based; spiral curriculum interleaving theory and practice; participatory, evidence-based reform processes; modular programme organisation.	Proportional Model's three-phase architecture achieves curriculum reform through standard-setting: 11 knowledge + 11 competency + 11 human development dimensions; ITEP's 7-component structure operationalises this.
4	Capacity-Building for Teacher Trainers	Systematic preparation of teacher educators; role differentiation; maintaining school connections; institutional incentives for practitioner research; 'doubly visible' professional development.	Phase roles: Phase 1 = Presenter/Organiser; Phase 2 = Facilitator/Guide; Phase 3 = Mentor/Supervisor. ITEP's school–university partnerships and action research supervision address this directly.
5	Quality Assurance, Evaluation & Monitoring	Multi-level QA: institutional self-evaluation, external accreditation, national monitoring; outcome-focused assessment of graduate competence; longitudinal tracking.	Formative (per phase), Summative (phase-end), Impact (longitudinal) evaluation architecture. ITEP's 10-point scale, portfolio, and internship evaluation provide the QA framework.
6	Supportive Partnerships	School–university partnerships; government engagement; teachers' unions; community organisations; structured mentoring in authentic school contexts; co-teaching arrangements.	School Experience component: Pre-internship, Observation, Research Project, Teaching Internship, Community Engagement — all institutionalise UNESCO's partnership principle across Phases 2 and 3.

Table 7: UNESCO Five Pillars — Requirements and Proportional Model Alignment

8. Findings

The analysis conducted in this paper yields the following principal findings:

- **Finding 1 — Structural Isomorphism:** A precise and theoretically coherent correspondence exists among Taxonomy of Teacher Education three domains, Bloom's three taxonomic dimensions, the three axes of the NCeF Tridimensional Model, the three transactional approaches of pre-service education, and the three canonical Teacher Education models. This correspondence — demonstrated in Table 1 — constitutes the primary theoretical contribution of this paper and has not been previously made explicit in the literature.
- **Finding 2 — The Rationale for the 1:2:3 Ratio:** The 1:2:3 proportional ratio (Knowledge Base: Human Development: Competency-Based) is theoretically justified by evidence from teacher effectiveness research, the developmental logic of professional formation, and the requirements of quality pre-service preparation. Knowledge without application and human development is insufficient; human development without knowledge and competence is unfocused; competence without knowledge and human development is technically skilled but educationally shallow. The progressive weighting reflects the reality that the further a dimension is from purely theoretical knowledge, the more time, practice, supervision, and context-sensitive learning it requires.
- **Finding 3 — Historical Imbalance:** Historical analysis reveals a consistent pattern of over-weighting the Knowledge Base Domain at the expense of the Human Development Domain and Competency-Based Domain in conventional pre-service Teacher Education programmes. The one-year B.Ed. programme suffered acutely from this imbalance, allocating approximately 80% of programme time to coursework while providing only 4–8 weeks of teaching practice. The Proportional Model identifies this imbalance as a primary structural cause of the persistent theory-practice gap in teacher preparation.
- **Finding 4 — Sequential Phase Architecture:** The Proportional Model requires a sequential three-phase architecture in which Phase 1 (Knowledge Acquisition) is prioritised, Phase 2 (Competency Development) is underemphasised relative to knowledge but progressively scaffolded, and Phase 3 (Human Development) is maintained at a consistently high emphasis throughout all phases. This sequence is non-arbitrary: it follows the developmental logic of professional formation from cognitive foundation through supervised competency to reflective professional identity.
- **Finding 5 — Transactional Approach Alignment:** The three transactional approaches — Expository (Phase 1), Collaborative (Phase 2), and Experiential (Phase 3, sustained throughout) — are not interchangeable alternatives but phase-specific instruments corresponding to the distinctive learning demands of each developmental stage. Their precise alignment with Taxonomy of Teacher Education three domains, Bloom's three taxonomic dimensions, and the three NCeF axes provides a theoretically complete and practically applicable curriculum design framework.
- **Finding 6 — Teacher Education Model Integration:** The three Models of Teacher Education — Behaviouristic, Competency-Based, and Inquiry-Oriented — are not mutually exclusive but sequentially complementary architectures within the proportional model. Their artificial opposition in the literature has contributed to persistent imbalances in pre-service programme design. The proportional model resolves this tension by repositioning them as Phase 1, Phase 2, and Phase 3 instruments respectively.

- **Finding 7 — UNESCO Validation:** UNESCO's six dimensions of Good Policy and Practice — good policy and practice, the policy environment, models of curriculum reform, capacity-building for teacher trainers, quality assurance and evaluation, and supportive partnerships — provide external validation for each structural component of the Proportional Model and align comprehensively with the ITEP framework.

9. Conclusion

This paper has proposed, developed, and validated a Proportional Model of Pre-Service Teacher Education — a theoretically grounded and practically applicable framework for organising the preparation of teachers across three interdependent domains: the Knowledge Base Domain, the Human Development Domain, and the Competency-Based Domain. The model integrates Taxonomy of Teacher Education Taxonomy of Teacher Education with Bloom's Educational Objectives, the Tridimensional Model of Learning (Academic, Experiential, and Skill axes in a 1:2:3 ratio from India's National Credit Framework), the three canonical transactional approaches (Expository, Collaborative, and Experiential Learning), the three established Teacher Education models (Behaviouristic, Competency-Based, and Inquiry-Oriented), and UNESCO's six-dimensional framework for quality pre-service teacher training.

The central normative claim of the Proportional Model is that effective pre-service Teacher Education cannot be achieved through any single-domain approach. The historic dominance of the Knowledge Base Domain — reflected in the prevalence of course-heavy, lecture-dominated pre-service programmes — has produced teachers who are informationally equipped but professionally underprepared. The affective, relational, and ethical dimensions of the Human Development Domain, and the practical, collaborative, and competency dimensions of the Competency-Based Domain, must receive proportionally greater investment than has historically been the case.

The 1:2:3 ratio of the NCrf Tridimensional Model provides the proportional architecture: Academic knowledge as foundation (1), Human Development as the integrating bridge (2), and Competency-Based skill as the ultimate professional purpose (3). Expository, Collaborative, and Experiential Learning serve as the methodological instruments of these three proportional dimensions, and the Behaviouristic, Competency-Based, and Inquiry-Oriented Models of Teacher Education represent their institutional expressions across the three phases of professional formation.

The Integrated Teacher Education Programme represents the most coherent and comprehensive institutional operationalisation of this proportional model currently available in India. Its 160-credit, eight-semester structure, with its seven curricular components, tridimensional internal credit allocation, stage-specific specialisation, and outcomes-based graduate attribute framework, provides a concrete and replicable template for institutions seeking to implement the proportional model in the post-NEP 2020 landscape.

Ultimately, the highest purpose of pre-service Teacher Education is the formation of educators who are intellectually grounded, professionally skilled, and humanly whole — educators who know their subject deeply, teach their learners effectively, and care for their students, their communities, and their own professional growth with sustained empathy and commitment. The Proportional Model provides the structural architecture through which this formation can be intentionally, proportionally, and systematically achieved. Future research should empirically test the model through programme-level

analysis of ITEP implementation, quantitative assessment of student-teacher outcomes across all three domains, and comparative longitudinal analysis of the effectiveness of ITEP graduates relative to graduates of the one-year B.Ed. programme.

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