"BALANCING DISCIPLINARY DEPTH WITH INTERDISCIPLINARY BREADTH"

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Abstract:

The Indian higher education system is undergoing a paradigm shift under the National Education Policy (NEP) 2020, moving from rigid disciplinary silos to fluid, interdisciplinary frameworks. This paper explores the operationalization of this shift through four distinct teaching models: the Thematic Studio model, the Cluster University model, the Interdisciplinary School model, and the Vertically Integrated Dual-Degree model. Using a qualitative case study approach, this research examines the implementation strategies of Ahmedabad University, HSNC University (Mumbai), Savitribai Phule Pune University (SPPU), and IIT Madras. The study finds that while "interdisciplinarity" is a unified policy goal, its execution varies significantly based on institutional autonomy and legacy structures. Private universities leverage "studio pedagogies" for immersion, while public state universities utilize "cluster models" to pool fragmented resources. The findings highlight that successful implementation relies not just on curriculum redesign but on the breakdown of faculty hierarchies and the introduction of flexible credit systems. This paper contributes to the academic discourse by offering a comparative analysis of these models, providing actionable recommendations for institutions struggling with the transition, and underscoring the social relevance of producing "T-shaped" graduates capable of solving complex, real-world problems.

Keywords

Interdisciplinary Education, NEP 2020, Higher Education India, Pedagogy, Cluster University, Studio Learning.

Introduction:

Higher education globally has recognized that complex 21st-century problems like climate change, inequality, public health crises which cannot be solved through the lens of a single discipline. The concept of "interdisciplinarity," where methods and insights from two or more disciplines are integrated to solve a problem, has become a gold standard in pedagogy.

In India, however, higher education has historically been defined by rigid compartmentalization. A student of "Commerce" could not study "History," and a "Science" student had no access to "Public Policy." This segregation has produced graduates with deep technical knowledge but often limited holistic perspective. The National Education Policy (NEP) 2020 seeks to dismantle these walls and mandates a multidisciplinary approach across all Higher Education Institutions (HEIs).

This paper investigates *how* Indian institutions are translating this policy mandate into classroom reality. It moves beyond theoretical discussions of NEP 2020 to analyze concrete "on-the-ground" models of interdisciplinary teaching.

Background

The Indian university system which were largely modeled on the colonial University of London structure were designed to produce specialists for administrative and industrial roles. This legacy created a "silo mentality" where departments operated as fiefdoms with little interaction.

- The Pre-NEP Era: Interdisciplinary studies were largely confined to elite research institutes (like IISc) or specific departments (e.g., Department of Women's Studies). Undergraduate education remained strictly segregated.
- The NEP 2020 Shift: The policy explicitly calls for **"holistic and multidisciplinary education"** with flexible curricular structures, creative combinations of subjects, and integration of vocational education. It proposes the "Academic Bank of Credits" (ABC) to facilitate student mobility across disciplines.

Literature Review

Global literature on interdisciplinary education emphasizes the "T-shaped" learner which means someone with deep domain expertise (the vertical bar) and broad cross-disciplinary skills (the horizontal bar).

Research by Chettri and Pegu (2023) notes that in India, the primary barrier is not student willingness but "faculty rigidity" and administrative inertia. Faculties trained in single disciplines often struggle to co-teach or design integrated assessments.

Studies from Ashoka University and IIT Delhi (2021) suggest that students exposed to interdisciplinary electives show higher aptitude in critical thinking and complex problem-solving compared to peers in traditional streams.

A significant portion of literature (*Journal of Education and Educational Technology*) highlights that state universities face severe resource constraints compared to private counterparts, making the "Cluster Model" a necessary innovation rather than just a pedagogical choice.

Research Methodology

This study employs a Qualitative Exploratory Case Study method. This approach is chosen because interdisciplinary implementation in India is a nascent phenomenon with limited quantitative longitudinal data.

- Data Sources: The study utilizes secondary data, including institutional policy documents, university curriculum brochures, press releases (PIB), and existing academic literature (2020–2025).
- Selection Criteria: Four institutions were selected to represent diverse institutional types:
    1. Private Liberal Arts University: Ahmedabad University (Gujarat).
    2. State Cluster University: HSNC University (Mumbai, Maharashtra).
    3. Public State University: Savitribai Phule Pune University (SPPU).
    4. Institute of National Importance: IIT Madras.

Discussion and Analysis

Case Study 1: The "Thematic Studio" Model (Ahmedabad University)

Ahmedabad University has pioneered a radical departure from the lecture format through its Foundation Programme.

- Mechanism: All incoming students, regardless of major, undergo a "Foundation Programme" organized around thematic "Studios" rather than subjects. Themes include *Water*, *Democracy & Justice*, and *Neighbourhoods*.
- Pedagogy: In the *Water Studio*, a biologist, a historian, and a policy expert might co-teach. The pedagogy explicitly values "muddling through" which is a process where students tackle ill-defined problems without a clear textbook answer.

This model forces interdisciplinarity at the *entry level* which ensures that a Commerce student understands the biological impact of industrial waste before learning how to account for it. It effectively breaks the "silo" mindset before disciplinary specialization begins.

Case Study 2: The "Cluster" Model (HSNC University, Mumbai)

HSNC University represents the "Cluster University" model which is a crucial innovation for resource-strapped state colleges. It was formed by pooling the resources of H.R. College, K.C. College, and Bombay Teachers' Training College.

- Mechanism: The university allows for resource and credit sharing. A student enrolled in H.R. College (Commerce focus) can take credit-bearing courses in Arts or Sciences at K.C. College.
- Pedagogy: This model integrates "Incubation" with "Curriculum." By linking entrepreneurship cells across colleges, the university merges theoretical commerce education with practical business creation skills which effectively blurs the lines between "academic" and "vocational" education.

This is a scalable model for India's massive state education sector. It does not require building new departments but rather connects existing ones to create new pathways for students.

Case Study 3: The "Institutional School" Model (SPPU)

Savitribai Phule Pune University (SPPU) established the Interdisciplinary School of Science (IDSS) to institutionalize flexibility within a traditional public university framework.

- Mechanism: The school offers a unique Bachelor of Arts (Liberal Arts) where students can major in Science subjects. This structural irony of including Science subjects within an Arts degree challenges the traditional hierarchy of degrees.
- Pedagogy: It relies heavily on the Choice-Based Credit System (CBCS) which allows students to mix "hard" disciplines (Mathematics) with "soft" disciplines (Music, History).

SPPU's model demonstrates that large public universities can innovate if they create autonomous "schools" within their larger structure to bypass general bureaucratic hurdles.

Case Study 4: The "Vertical Integration" Model (IIT Madras)

IIT Madras addresses the need for management and humanities skills in engineering graduates through its Interdisciplinary Dual Degree (IDDD) program.

- Mechanism: An engineering undergraduate can, after the 5th semester, pivot to a Master's in a completely different field such as *Quantitative Finance*, *Complex Systems*, or *Public Policy*.
- Pedagogy: This is a "T-shaped" pedagogical model. The first 2.5 years provide rigorous engineering depth (vertical), while the final 2 years broaden the student's horizon (horizontal) into interdisciplinary applications.

This model is highly effective for technical institutions which ensures that "interdisciplinary" does not mean "diluted." The technical rigor is maintained while adding a layer of broad application.

Findings

The findings of this study reveal that interdisciplinary education in India is not a monolithic concept but it is being executed in two distinct ways based on institutional reality. Private universities who enjoy financial and administrative autonomy develop and innovate through pedagogy. They are changing how they teach, utilizing immersive methods like "Studios" where students learn by doing. In contrast, the public universities who are constrained by legacy systems are innovating through structure. They are focusing on "rearranging the furniture" such as creating Cluster Universities or interdisciplinary schools that help pool existing resources effectively.

Furthermore, the success of these models hinges largely on faculty dynamics. The study highlights that true "interdisciplinarity" requires "Team Teaching," where professors from different fields actively collaborate in the classroom. When this collaboration is missing, the result is merely "multidisciplinary" where a student might take a History class and a Biology class, but the subjects remain separate in their mind because the teachers never interact.

Finally, a critical bottleneck identified is the "Assessment Lag." While the curriculum has modernized to address complex, real-world problems, the testing machinery has remained stuck in the past. Most institutions continue to rely on traditional, three-hour written exams. These old tools are ill-equipped to measure the new skill such as critical synthesis and creative problem-solving that interdisciplinary courses are designed to build. Only a few pioneers have successfully aligned their testing with their teaching by adopting project-based assessments.

Conclusion

The shift towards interdisciplinary teaching in India is no longer just a policy directive but a practicing reality. The case studies show that Indian institutions are innovating in unique ways like Ahmedabad University through immersive studios, HSNC University through resource clustering, and IIT Madras through vertical integration. The "silo" is being dismantled, not by destroying disciplines, but by building bridges between them. The success of these models serves as a blueprint for the wider Indian higher education sector as it navigates the NEP 2020 transition.

Limitations

This study has a few important limitations that must be acknowledged. First, it relies entirely on secondary data, such as university reports and official policy documents which neglects direct observations from inside the classroom. This means the research analyzes how these courses are planned on paper, rather than how they are

actually experienced by students and teachers in reality. Second, there is a clear urban bias in the selection of case studies. Since the examples are drawn from major metropolitan hubs like Mumbai, Pune, and Chennai, the findings may not reflect the unique resource struggles faced by colleges in rural India. Finally, because most of these interdisciplinary programs were launched after 2020, they are still too new to evaluate for long-term success. We do not yet have enough data to measure how these degrees will truly impact graduates' future careers or their ability to get jobs over the coming decade.

Recommendations

For Faculty: Training programs must shift from "subject expertise" to "collaborative teaching." Faculty Development Programmes (FDPs) should focus on how to co-design courses with colleagues from opposing disciplines.

For Administrators: The "Cluster Model" should be aggressively adopted by smaller colleges in Tier-2 cities to pool faculty resources, rather than struggling to hire new specialists for every subject.

For Policymakers: Assessment reforms must accompany curricular reforms. The UGC should release guidelines for "Interdisciplinary Assessment" to encourage project-based grading over standardized testing.

Future scope

While this exploratory paper establishes a strong foundation by mapping out existing models of interdisciplinary teaching in India, it opens the door to several critical areas that demand further investigation. The current research has largely focused on the institutional and structural side of things as to how universities are building these programs. However, the most important variable that is the atudents , is still a ripe area for future inquiry.

First and foremost, future research must pivot to the student experience. We know how these courses are designed, but we know very little about how they are received. Are students finding it easier to connect the dots between diverse subjects, or are they feeling overwhelmed? A qualitative study involving student interviews and focus groups could reveal the "lived experience" of interdisciplinary learning. This would help educators understand if the intended "freedom to choose" is actually resulting in "decision paralysis" for young learners.

Secondly, there is a pressing need for quantitative studies on employability. The central promise of the NEP 2020 and these new teaching models is that they produce "better" graduates. But what does "better" mean in the job market? Future researchers should design longitudinal studies that track the career trajectories of interdisciplinary graduates versus traditional single-discipline graduates. Do "T-shaped" students actually get hired faster? Do they earn higher starting salaries? Do they advance more quickly into leadership roles? Measuring this "employability index" with hard data would provide the ultimate validation for these pedagogical shifts.

Finally, a fascinating area for future study lies in cognitive science and pedagogical pacing. Asking a student to switch from a rigorous calculus class to a philosophy seminar and then to a coding lab in a single day imposes a significant "cognitive load." We need to understand the mental toll of this code-switching. Does the brain need "transition time" between such distinct modes of thinking? Research into this could directly inform how timetables are structured, ensuring that we are stretching students' minds without snapping them.

Academic and Social Relevance

Academic Relevance

In the wake of the National Education Policy (NEP) 2020, Indian academia is currently in a state of rapid transition. This paper serves as a timely and practical contribution to that chaotic landscape. While much of the existing literature discusses the theory of NEP 2020 by debating its ideals and goals, there is a scarcity of literature that documents the practice. By offering concrete case studies of how institutions have actually implemented these ideas, this research moves the academic conversation from "what should we do?" to "how can we do it?" It provides a "playbook" or a set of diverse frameworks that other colleges, whether they are resource-rich private institutes or resource-constrained state colleges can replicate and adapt. It bridges the gap between high-level policy and ground-level classroom management.

Social Relevance

The relevance of this research extends far beyond the university gates. We live in a world defined by "wicked problems" where the challenges are messy, complex, and resistant to simple solutions. Climate change is not just a scientific problem but it is also an economic, political, and sociological one. Public health crises are not just medical issues but they are logistical and communicative challenges.

When we train students in silos, we equip them to see only one piece of the puzzle. A scientist might design a solution that is technically perfect but culturally unacceptable, an economist might propose a policy that is financially sound but socially disastrous. By documenting how to train students who are "bilingual", the one who can speak the languages of both technology and sociology, or public policy and design, this research supports the creation of a more capable workforce. These interdisciplinary graduates are the citizens who will be equipped to drive sustainable and inclusive growth in India. They will be the policymakers who understand data, the entrepreneurs who understand ethics, and the architects who understand community dynamics. Ultimately, better-integrated education leads to a better-integrated society, one capable of handling the nuances and complexities of the modern world.

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