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Why Indian Schools Need Multidisciplinary Teaching: Voices from NEP 2020 and Beyond

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Abstract
Multidisciplinary teaching integrates knowledge and skills from different subjects to create meaningful and connected learning experiences. This paper explores its significance in the Indian context with reference to the National Education Policy (NEP 2020) and the National Curriculum Framework for School Education (2023). Drawing on policy review and existing literature, it highlights the benefits of multidisciplinary approaches, including improved critical thinking, creativity, collaboration, and real-world application of knowledge. At the same time, it identifies barriers such as rigid timetables, exam-driven curricula, insufficient teacher preparation, and limited resources that restrict effective practice in schools. To address these challenges, the paper recommends flexible scheduling, teacher capacity building, co-teaching, thematic lesson planning, and assessment methods that value higher-order skills. It also stresses the need for experimental classroom research to provide empirical evidence on how multidisciplinary teaching influences student skill development. The study concludes that with structural support and practical strategies, multidisciplinary teaching can move from policy vision to classroom reality, equipping learners for 21st-century challenges.
Keywords*: Multidisciplinary Teaching, National Education Policy (NEP) 2020, Holistic Education,21st-Century Skills.*

1 INTRODUCTION

1.1 Context of Multidisciplinary Teaching

Multidisciplinary teaching is an approach where ideas, skills, and perspectives from different subjects are brought together to give students a more connected and meaningful learning experience (Sahu & Khan, 2024; Verma & Shankar, 2023). Instead of learning subjects in isolation, students can explore a topic from various angles, which helps them think critically, solve problems creatively, and link classroom learning to real life (Mishra & Thakur, 2023; Yadav, 2024). In India, the National Education Policy 2020 strongly supports this idea by encouraging schools to break rigid subject divisions, offer flexible subject choices, and use project-based and theme-based learning (Ministry of Education, 2020; Naik & Shah, 2023). For example, at the secondary stage, students can combine subjects like History, Mathematics, and Music, moving beyond the traditional Arts-Commerce-Science streams (NEP 2020; NCERT, 2023). Research shows that this method increases engagement and motivation because it relates lessons to real-world issues, such as studying climate change through science, geography, and civics (Sharma & Gupta, 2024; Kumar et al., 2023). It also helps students see

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knowledge as connected, improving understanding, creativity, and memory (Patil, 2024; Yadav & Singh, 2023). However, schools face challenges such as rigid timetables, exam-focused curricula, lack of teacher training, and limited resources, which make it hard to implement multidisciplinary teaching effectively (Nahid & Gupta, 2021; Singh, 2023; Chhablani, 2024; Strober, 2006). Addressing these barriers requires structural reforms, teacher capacity-building, and access to practical tools like SCERT Delhi's Multidisciplinary model lesson plans, along with strategies such as flexible scheduling, co-teaching, and purposeful use of digital technologies to support collaboration (SCERT Delhi, 2022; Nguyen & Thai, 2023; Siminto et al., 2024). Therefore, advancing multidisciplinary teaching in Indian schools is not just a policy recommendation but a necessary step to realise NEP 2020's vision of holistic, future-ready education**.**

1.2 Rationale of the study

Existing research on multidisciplinary teaching in India remains largely conceptual, with most studies focusing on policy frameworks and theoretical discussions rather than classroom-based evidence of effectiveness (Nguyen & Thai, 2023; Norton et al., 2022). While initiatives such as SCERT-Delhi have developed modules, these are primarily designed for primary levels, and a notable absence of such structured and tested models for the secondary education could be seen (SCERT Delhi, 2022; NCERT, 2023). Similarly, although national documents advocate holistic assessments like portfolios and peer evaluations, practical and reliable tools for secondary classrooms are yet to be established (NCERT, 2023; Ministry of Education, 2020). Rigid timetables, exam-driven culture, and limited teacher preparation are frequently cited, but empirical evidence on how these constraints affect student learning outcomes is scarce (Chhablani, 2024; Nahid & Gupta, 2021). Moreover, most schools implement multidisciplinary teaching through short-term events like project days rather than sustained programmes, resulting in little documentation of long-term impact (Norton et al., 2022; Chhablani, 2024). There is also a lack of practical resources such as lesson plans, subject pairings, and assessment rubrics that teachers can directly adopt (Ministry of Education, 2020; Singh, 2023). Finally, studies seldom monitor the fidelity of implementation, with teacher logs and classroom observations rarely incorporated into research designs (Nahid & Gupta, 2021; Kathuria & Chaudhary, 2023). This study is therefore needed to bridge the gap between NEP 2020's /NCFSE 2023 vision and classroom reality by generating evidence-informed strategies tailored to Indian school education.

1.3 Objectives of the Study

1. To Explore the concept and benefits of multidisciplinary teaching with reference to NEP 2020.
2. To identify common challenges schools and teachers face in applying Multidisciplinary teaching
3. To suggest practical strategies for effective implementation of multidisciplinary teaching in schools.

2.Methodology

This paper draws on secondary sources, including research articles, policy documents such as NEP 2020 and NCFSE 2023, and relevant reports. The insights drawn from these reviews form the basis of the discussion and arguments presented in the paper.

2. Literature review

2.1 Multidisciplinary and NEP 2020

The idea of multidisciplinary teaching has gained global prominence and is strongly emphasised in India through the National Education Policy (NEP) 2020. It broadly refers to bringing together knowledge from different disciplines to enrich understanding and problem-

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solving, without fully merging them. While respecting subject boundaries, it encourages connections for a more comprehensive learning experience (Sahu & Khan, 2024).

Defining Multidisciplinary Teaching

Multidisciplinary teaching integrates knowledge, skills, and perspectives from multiple subjects to create holistic learning. Instead of treating disciplines as isolated silos, it promotes lessons and projects that link concepts across fields, enabling students to relate classroom knowledge to real-world contexts. This approach cultivates 21st-century skills such as critical thinking, problem-solving, and adaptability, preparing learners for complex issues requiring insights from more than one discipline (Verma & Shankar, 2023). It involves using content, methods, or perspectives from two or more fields to study a theme or issue, differing from traditional teaching by fostering cross-subject collaboration and real-life engagement. According to Naik and Shah (2023), this approach allows students to see knowledge as interconnected rather than compartmentalised.

It is important to distinguish between multidisciplinary, interdisciplinary, and transdisciplinary approaches, often used interchangeably but differing in integration levels:

- Multidisciplinary: Brings together knowledge from different subjects, but each remains within its boundary side-by-side learning.
- Interdisciplinary: Integrates methods and perspectives across subjects for a more coherent understanding.
- Transdisciplinary: Moves beyond academic disciplines to address real-world problems, often including community knowledge or personal experience (Rathod, 2024; Yadav, 2024).

In simple terms, multidisciplinary means learning *with* different subjects; interdisciplinary means learning *between* them; transdisciplinary means learning *beyond* them (Mishra & Thakur, 2023).

NEP 2020's Vision of Multidisciplinary Learning

NEP 2020 strongly emphasises breaking subject silos and promoting holistic, integrated learning. It envisions schools where students examine topics from multiple perspectives, fostering deeper understanding and critical thinking. The policy states: *"Departments in Languages, Literature, Music, Philosophy, Indology, Art, Dance, Theatre, Education, Mathematics, Statistics, Pure and Applied Sciences, Sociology, Economics, Sports, and other such subjects will be set up and strengthened at all Higher Education Institutions (HEIs), and will aim to become multidisciplinary institutions"* (NEP 2020, p. 34).Though directed at higher education, this philosophy is deeply embedded in school reform.

At the school level, NEP 2020 urges a move away from rigid silos to more theme-based, holistic learning. It states: *"Students will be given increased flexibility and choice of subjects to study, particularly in secondary school-including subjects in physical education, the arts and crafts, and vocational skills-so that they can design their own paths of study and life plans"*(NEP2020, p.14)

This represents a major shift from the traditional Science-Commerce-Arts streams and aligns with global 21st-century education trends.

Curriculum Recommendations: Middle and Secondary Stages

NEP introduces a 5+3+3+4 model of school education, where the middle (Grades 6-8) and secondary stages (Grades 9-12) are particularly targeted for multidisciplinary approaches. At the middle stage, students are expected to develop critical thinking and explore subject connections through experiential and project-based learning (Naik & Shah, 2023). At the secondary stage, the policy encourages flexibility in subject choices, allowing combinations previously restricted under rigid streams. For example, a student may combine History with Mathematics and Music-options not permitted earlier (NEP 2020, pp. 13-15).

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2.1.1 Benefits of Multidisciplinary Learning for School Students

Multidisciplinary learning has been widely acknowledged as a powerful pedagogical approach for enhancing students' academic and personal growth. By allowing students to view concepts through the lenses of multiple subjects, it not only deepens understanding but also cultivates skills essential for life in the 21st century. Verma and Shankar (2023) highlight several benefits of adopting multidisciplinary teaching in education. They state that integrating knowledge and perspectives from different fields develops students' critical thinking, problem-solving skills, and adaptability. This approach also supports the holistic development of learners by enabling them to connect concepts across disciplines and apply them in diverse contexts.

2.1.2 Critical Thinking, Engagement, and Real-World Skills

Research consistently shows that multidisciplinary approaches foster critical thinking by pushing students to connect ideas across subject boundaries (Sharma & Gupta, 2024). For instance, examining climate change through science, geography, and civics compels them to analyse, compare, and evaluate information from diverse perspectives, building higher-order thinking skills. Such approaches also boost engagement, as learning links directly to real-world issues and personal interests (Kumar et al., 2023). Lessons that integrate arts, science, and social studies become more relatable to students' experiences, shifting them from passive listeners to active participants. Banerjee and Mehta (2024) note that this real-life relevance significantly enhances motivation and persistence.

2.1.3 Holistic and Connected Learning

Multidisciplinary education aligns with NEP 2020's vision of holistic learning, enabling students to see knowledge as connected rather than fragmented and nurturing adaptability (Patil, 2024). For example, applying mathematics in architectural design or historical data analysis highlights its practical relevance instead of treating it as an isolated skill. Cognitively, integrated learning activates multiple areas of the brain, strengthening understanding and long-term retention (Yadav & Singh, 2023). Psychologically, it sparks curiosity and creativity, both vital for holistic development.

2.1.4 Cognitive and Psychological Support from Integration

Cognitive science shows that integration deepens learning by creating a web of interlinked concepts instead of isolated facts (Banerjee & Mehta, 2024). This interconnectedness improves knowledge transfer to new situations a mark of genuine understanding. Psychologically, multidisciplinary teaching gives learning a sense of purpose. Students see subjects not merely as academic requirements but as tools for interpreting and navigating the real world (Patil, 2024). This intrinsic value fuels motivation and builds lifelong learning habits.

2.1.5 Case Study from Indian Schools

Several Indian schools are experimenting with project- and theme-based multidisciplinary approaches aligned with NEP 2020. For instance, a Delhi secondary school combined History, Political Science, and Literature in a project on "Indian Independence," where students researched historical events, analysed political speeches, and staged dramatic presentations using literary works from that era (Sharma & Gupta, 2024). This enhanced both subject mastery and collaboration skills. Likewise, a pilot programme in Maharashtra linked Environmental Science with Art and Mathematics by tasking students to design eco-friendly school spaces. The project not only strengthened academic outcomes but also fostered values of sustainability and innovation (Kumar et al., 2023).

2.2 Challenges in Implementing Multidisciplinary Teaching-Learning in Indian Schools

The NEP 2020 envisions dismantling rigid subject boundaries and promoting a flexible, integrated curriculum to support holistic education (Ministry of Education, 2020). Yet, research highlights multiple systemic, curricular, and resource-based barriers to implementation.

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2.2.1 Rigid subject divisions and institutional culture

Despite policy reforms, most schools still operate within strict subject silos, where timetables, teacher assignments, and assessments remain discipline-bound (Nahid & Gupta, 2021; Singh, 2023). Such structures hinder collaborative planning, as each department adheres to its own curriculum and pacing (Kathuria & Chaudhary, 2023; Chhablani, 2024). Beyond structure, entrenched disciplinary "habits of mind" also create resistance: teachers bring contrasting norms for discussion, evidence, and critique, which, if not addressed, can cause misunderstandings (Strober, 2006).

2.2.2 Textbook and syllabus constraints

Curricula and textbooks remain designed for single-subject delivery, aligned with board examinations that emphasise rote learning over conceptual integration (Singh, 2023; Chhablani, 2024). Although NEP 2020 advocates reducing content load and integrating themes, the lack of integrated curriculum models and assessment rubrics limits teachers' ability to go beyond subject-specific teaching (Ministry of Education, 2020; Kathuria & Chaudhary, 2023).

2.2.3 Timetable and workload limitations

Rigid timetables with short, isolated subject periods prevent extended interdisciplinary projects or co-teaching (Nahid & Gupta, 2021; Singh, 2023). Cross-departmental collaboration requires shared planning time, which schools rarely provide (Norton et al., 2022; Kathuria & Chaudhary, 2023). Strober (2006) further notes that effective collaboration needs time for relationship-building and negotiation of goals-an element largely absent in current schedules.

2.2.4 Lack of teacher preparedness and training

Most educators have not been trained to design and deliver multidisciplinary lessons, as teacher education in India remains subject-specific (Chhablani, 2024; Kathuria & Chaudhary, 2023). In-service programmes are often limited and theoretical, leaving teachers without practical strategies (Nahid & Gupta, 2021; Singh, 2023). Strober (2006) adds that without explicit preparation in cross-disciplinary communication, teachers tend to revert to their own field's comfort zone, weakening integration**.**

2.2.5 Infrastructure and resource gaps

Many rural and low-income schools lack flexible spaces, ICT tools, and laboratory facilities needed for integrated projects (Kathuria & Chaudhary, 2023; Singh, 2023). Without these resources, multidisciplinary learning remains aspirational rather than practical.

2.2.6 Teacher voices: enthusiasm and practical constraints

Teacher perspectives reveal both enthusiasm and frustration. While many welcome multidisciplinary learning, they cite exam pressures, rigid curricula, lack of planning time, and minimal institutional support as barriers (Nahid & Gupta, 2021; Chhablani, 2024; Norton et al., 2022). International research echoes these findings, showing success depends on administrative backing, aligned assessments, and time for collaboration (Norton et al., 2022). Strober (2006) also highlights power dynamics, where differences in disciplinary prestige can discourage open participation, particularly from less dominant subjects.

2.3 Strategies for effective implementation of multidisciplinary teaching in schools.

The implementation of multidisciplinary teaching requires deliberate structural reforms, well-designed modules, and ongoing teacher development. The National Curriculum Framework for School Education (NCERT, 2023) calls for longer instructional blocks for cross-subject projects, "bagless days" for experiential and community learning, assessment reforms that prioritise conceptual understanding, and Activity/Elective Programme slots for clubs and field activities (NCERT, 2023). SCERT Delhi's Multidisciplinary Teaching-Learning Plans provide practical, activity-based templates for example, a Class 5 English unit that integrates

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conservation reading, ecological vocabulary, poster art, and civic discussion-so teachers can embed themes across language, social studies, science, and arts without redesigning entire curricula (SCERT Delhi, 2022). International studies show extended periods, co-teaching, joint planning, and real-world projects deepen learning (Wicklein & Schell, 1995; Nguyen & Thai, 2023), while digital platforms and multimedia tools when paired with targeted professional development-expand opportunities for project-based interdisciplinary work (Siminto et al., 2024).

2.3.1 Recommendations

To address the challenges identified, several practical strategies could be considered.

- First, schools should adopt flexible scheduling models, such as block periods or designated integration days, to create time for cross-curricular projects without undermining exam preparation.
- Second, capacity building for teachers must be strengthened through hands-on professional development, collaborative planning time, and access to model lesson plans that demonstrate practical approaches to integration.
- Third, assessment systems should incorporate rubrics and performance-based tasks that capture higher-order skills, while still aligning with board requirements.
- Fourth, low-cost and locally relevant resources should be leveraged, including community knowledge and simple ICT tools, to make integrated projects feasible in diverse school contexts.
- Fifth, school leadership and community involvement are essential for supporting teacher collaboration, providing institutional flexibility, and enriching classroom learning with real-world perspectives.
- Finally, at the research level, there is a need for experimental classroom studies that systematically measure how multidisciplinary teaching contributes to the development of critical thinking, collaboration, and other 21st-century skills. Such studies would generate empirical evidence to validate the potential of multidisciplinary education and guide its wider adoption in Indian schools.

3.Discussion

Multidisciplinary teaching is no longer just an idea in educational theory but a practical vision strongly backed by policy. The NEP 2020 and the National Curriculum Framework 2023 emphasise flexibility, project-based learning, and reforms such as extended instructional blocks and “bagless days” to enable cross-subject integration (Ministry of Education, 2020; NCERT, 2023). This foundation signals that India has the policy readiness to embrace integration, but the challenge lies in moving from vision to everyday classroom practice. Students taught through multiple disciplinary lenses are more likely to develop critical thinking, problem-solving, and real-world application skills (Sharma & Gupta, 2024; Patil, 2024). Yet, these benefits remain unevenly realised because of structural constraints such as rigid timetables, exam-driven curricula, and inadequate teacher preparation (Singh, 2023). These barriers are less about lack of interest from teachers and more about the system itself-teachers are pressed for time, heavily focused on syllabus completion, and rarely provided with integrated lesson models that are easy to adopt.

The success of multidisciplinary teaching will depend on small but deliberate adjustments within existing systems rather than large-scale overhauls. For example, a fixed longer lesson each week only for multidisciplinary work or an integration day can create the necessary space for cross-curricular learning without disturbing exam preparation. Models such as SCERT Delhi’s thematic lesson plans show how textbook content can be delivered through themes, making integration practical and reducing the extra burden on teachers (SCERT Delhi, 2022). Similarly, simple rubrics for skills like reasoning, collaboration, and application used alongside

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traditional tests can give legitimacy to integrated teaching within school assessments. Another important dimension is equity. While urban schools may experiment with technology-driven projects, rural and resource-limited schools can still achieve meaningful integration by using local contexts as learning resources. Markets, panchayat activities, or community practices can be turned into case studies that cut across subjects, ensuring that multidisciplinary teaching does not remain restricted to privileged settings.

The biggest gap lies in research. While policies and descriptive accounts underline the promise of multidisciplinary education, very few studies rigorously measure its actual impact on skills like critical thinking and collaboration in Indian classrooms (Norton et al., 2022). Experimental studies that compare conventional teaching with integrated approaches would provide much-needed evidence to guide policy and practice. This discussion reinforces that bridging the gap between NEP 2020's vision and classroom practice will depend on sustained reforms and the creation of practical, adaptable strategies that empower teachers and engage learners.

4.Conclusion

This study highlights that multidisciplinary teaching, as envisioned by the National Education Policy 2020, is central to achieving holistic and future-oriented education in India. The review of literature shows that such approaches enhance students' critical thinking, creativity, collaboration, and capacity to apply knowledge in real-world contexts. At the same time, persistent barriers such as rigid subject divisions, exam-oriented curricula, limited teacher preparation, and lack of resources make implementation challenging in secondary schools. The analysis suggests that while the policy intent provides a strong foundation, translating this vision into classroom practice requires deliberate structural reforms, teacher support, and context-sensitive strategies. Bridging this gap is essential for moving beyond subject silos and ensuring that the benefits of multidisciplinary education reach learners in meaningful and sustainable ways.

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