



## Integrating disciplines: The role of a multidisciplinary approach in social science research

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### Abstract

In recent decades, social science research has increasingly embraced a multidisciplinary approach to address the complexity of social issues. This article explores the growing significance of multidisciplinary research in addressing complex global and national challenges that transcend traditional disciplinary boundaries. It highlights how integrating science, technology, social sciences, and the humanities can generate inclusive, sustainable, and context-specific solutions to issues such as climate change, health disparities, and technological transformation. Drawing on examples like the Institute for Bioengineering of Catalonia and India's National Education Policy (NEP) 2020, the paper underscores the importance of institutional mechanisms, collaborative structures, and experiential learning in fostering a culture of interdisciplinary. The paper also outlines methodological approaches and strategies for successful integration. It also examines the persistent challenges—epistemological divides, methodological conflicts, and institutional barriers—that hinder the full realisation of multidisciplinary collaboration. The discussion concludes that deliberate policy reforms, ethical reflection in technological contexts, and continuous feedback mechanisms are crucial for strengthening interdisciplinary ecosystems. Ultimately, multidisciplinary research is presented as both an academic necessity and a moral imperative for sustainable and equitable development.

**Keywords:** Multidisciplinary research, holistic education, collaboration, sustainable development, NEP 2020

### Introduction

The accelerating pace of global change—spanning climate challenges, demographic transitions, advances in biotechnology, the proliferation of digital economies, and the rise of artificial intelligence—underscores the centrality of research to national progress. For India, the aspiration to establish itself as a knowledge leader in these diverse domains necessitates a substantial strengthening of its research capacity and output. Research today is not only an instrument of technological and economic development but also a foundation for intellectual, societal, and environmental advancement. However, India's current expenditure on research and innovation, at 0.69% of GDP, remains markedly lower than that of leading research-driven nations, thereby highlighting a critical gap that must be addressed to realise its full potential.

Modern social issues are deeply interconnected with economic, political, environmental, and cultural factors, making them too complex for any single discipline to address alone. Interdisciplinary research in the social sciences allows for richer and more impactful insights by drawing on diverse theories, methods, and perspectives. This article examines the significance of such research, the challenges it faces, and key methodological approaches for effective integration.

### Research Objective

This article seeks to analyse the National Education Policy (NEP) 2020 with particular attention to its promotion of a multidisciplinary paradigm, and to assess the ways in which this orientation expands the scope, depth, and potential trajectories of social science research in India.

### Research Methodology

This study employs a qualitative, review-based methodology to analyse the National Education Policy

(NEP) 2020 with a focus on its multidisciplinary orientation and implications for social science research.

### Multidisciplinary Research as a Necessity for Social Science Research

The contemporary world is undergoing rapid transformations in its knowledge and innovation landscape. Breakthroughs in artificial intelligence, machine learning, big data, and other advanced technologies are reshaping economies and labour markets. While automation reduces the demand for unskilled labour, it simultaneously increases the need for professionals trained in mathematics, computer science, and data science (World Bank, 2019) <sup>[9]</sup>. At the same time, pressing global challenges such as climate change, environmental degradation, depletion of natural resources, and the emergence of pandemics highlight the importance of research in biology, chemistry, physics, agriculture, climate science, and public health (National Research Council, 2014) <sup>[5]</sup>.

For India, these global changes converge with pressing domestic challenges. Providing universal access to clean water and sanitation, quality healthcare, inclusive education, sustainable energy, improved infrastructure, and enhanced air quality cannot be addressed through science and technology alone. Effective solutions require a nuanced understanding of India's socio-cultural diversity, governance structures, and environmental realities. This is where the integration of the social sciences and humanities becomes critical. Without such perspectives, technological interventions risk being socially exclusionary or environmentally unsustainable (OECD, 2019) <sup>[6]</sup>.

In this context, the importance of multidisciplinary and interdisciplinary research cannot be overstated. The social sciences offer insights into human behaviour, governance, and socio-economic dynamics, while the humanities strengthen cultural identity, creativity, and ethical

awareness. Their integration with advances in science and technology provides a comprehensive framework for developing solutions that are technically viable and socially responsive. The United Nations Sustainable Development Goals (SDGs) explicitly reinforce this multidimensional approach, emphasising goals such as quality education (SDG 4), good health and well-being (SDG 3), clean water and sanitation (SDG 6), affordable and clean energy (SDG 7), and climate action (SDG 13) (United Nations, 2015) [8]. Achieving these goals requires collaboration across disciplines and the blending of technical innovation with social understanding.

Indian policy also acknowledges the centrality of a multidisciplinary. The National Education Policy (NEP) 2020 calls for a paradigm shift in higher education by promoting multidisciplinary learning and research, highlighting the importance of integrating sciences with social sciences, humanities, and the arts (Ministry of Human Resource Development, 2020) [4]. The policy explicitly recognises that knowledge systems cannot remain fragmented if India is to address its complex developmental challenges and attain the goal of becoming a global knowledge leader.

Equally important is the need to strengthen indigenous research capabilities. Conducting high-quality research within India ensures that local challenges are studied in their appropriate contexts while also enabling the country to adapt and apply global innovations. These fosters both self-reliance and international competitiveness, positioning India as an active contributor to global knowledge production.

India's progress toward becoming a developed nation and one of the world's leading economies will depend on its ability to foster multidisciplinary research ecosystems. Integrating science and technology with the social sciences and humanities is not merely an academic exercise but a national imperative. Such integration will enable the country to generate solutions that are not only innovative but also inclusive, sustainable, and aligned with both national priorities and global frameworks such as the SDGs.

The Hindu article highlighted that employers today increasingly seek candidates who demonstrate critical thinking, emotional intelligence, effective communication, and innovative problem-solving abilities. It was observed that subjects such as literature, history, psychology, music, and philosophy nurture empathy, curiosity, and social awareness, all of which are essential for addressing complex societal challenges. The discussion strongly emphasised the need for a multi-disciplinary approach to academics, encouraging students to move beyond traditional educational frameworks in order to acquire skills relevant to real-world situations. The parents are called on to shift their focus away from an overemphasis on marks, ranks, and examination results. With many institutions now adopting competency-based frameworks and offering more flexible admission criteria, the message underscored a changing academic landscape that prioritizes holistic development over purely numerical achievements (Bhattacharya, 2025) [1].

The boundaries between disciplines such as sociology, economics, political science, anthropology, psychology, and geography are increasingly porous. For instance, to understand rural poverty, one must examine economic conditions (economics), cultural patterns (anthropology), governance structures (political science), and social

behaviour (sociology and psychology). As Frodeman (2010) [2] notes, the growing complexity of societal challenges necessitates problem-focused research that transcends disciplinary silos. The Sustainable Development Goals (SDGs) by the United Nations exemplify this integrated approach, requiring insights from multiple disciplines to meet targets such as poverty alleviation, gender equality, and climate action.

When government programs converge, they demand collaboration among multiple departments and ministries. Such coordination ensures that development initiatives are not carried out in isolation but are implemented through shared responsibilities and collective efforts. For researchers, this convergence highlights the importance of looking beyond single-discipline boundaries. To understand the complexities of governance, policy implementation, and social outcomes, a multidisciplinary approach becomes indispensable.

By drawing knowledge from diverse fields—such as economics, sociology, political science, management, public health, and technology—researchers can see how various components of the system interact with each other. This allows them not only to understand development issues more holistically but also to generate practical insights that are directly relevant to society. One key advantage of this approach is its ability to identify administrative rigidities across different line departments and ministries. Often, bureaucratic silos, overlapping mandates, or a lack of coordination hinder the smooth implementation of programs. Multidisciplinary research provides the tools to analyse these institutional challenges, highlight inefficiencies, and suggest reforms that improve governance structures. In doing so, it can make a direct contribution to shaping administrative policies.

Moreover, this type of research has a strong societal value. It goes beyond academic knowledge generation and addresses how governance affects people's daily lives—be it in education, healthcare, livelihoods, or social welfare. By bridging disciplines and engaging with real-world systems, researchers can help create policies that are not only more effective and responsive but also more inclusive and equitable.

In short, multidisciplinary research is essential not just for gaining knowledge but for understanding the system as a whole, identifying areas of administrative rigidity, and contributing to policies that enhance both governance and societal well-being.

### **Methodological Approaches in Multidisciplinary Research**

Societal challenges in India and globally are complex, interconnected, and multidimensional, requiring solutions that integrate science, technology, social sciences, and humanities. Multidisciplinary research provides the tools to understand these complexities, generate context-specific insights, and guide policy interventions that are inclusive, sustainable, and effective.

A successful multidisciplinary research methodology requires deliberate institutional strategies that promote collaboration, inclusivity, and societal engagement. The Institute for Bioengineering of Catalonia (IBEC) demonstrates this through structural integration, such as open-plan laboratories and shared management of facilities, which encourage interaction and resource-sharing across

disciplines. Talent development is fostered through mentoring and coaching programs that emphasise collaboration, including clinical mentoring schemes that connect PhD students with practitioners to ensure translational relevance of their projects. Equally important is engaging with ethics, philosophy, equity, and diversity, alongside outreach and science education, which strengthen researchers’ ability to communicate with society and address complex challenges.

Institutional mechanisms further reinforce this culture through gender and diversity committees, as well as initiatives for sustainable research practices, embedding inclusivity and responsibility within research ecosystems. The impact of these strategies is evident in the publication of 176 peer-reviewed articles between 2018 and 2022 involving collaboration between multiple IBEC groups. This example illustrates that nurturing talent, fostering interaction across fields, embedding societal values, and supporting diversity and sustainability are key methodological approaches for building a thriving multidisciplinary research environment (Sanchis, 2023) [7].

**Holistic and Multidisciplinary Education**

The National Education Policy (NEP) 2020 emphasises holistic and multidisciplinary education as a means to develop individuals intellectually, emotionally, and socially. It envisions a shift from rote learning toward fostering critical thinking, creativity, and practical problem-solving through experiential and project-based learning. The policy promotes assessment methods that evaluate understanding, application, and transferable skills rather than memorisation. By encouraging trust-based institutional governance and integrating internships and research projects, NEP 2020 places interdisciplinary inquiry at the core of higher education reform. Ultimately, it seeks to nurture individuals with humanistic and philosophical outlooks who can connect knowledge with ethical values, cultural understanding, and real-world challenges—aligning education and research with the broader goals of personal growth and societal progress (Lakhani, 2024) [3].

Education must integrate sciences, social sciences, humanities, arts, and sports to ensure the unity of knowledge and foster creativity, critical thinking, and innovation. Instead of rote content-heavy learning, pedagogy should emphasise experiential, inquiry-driven, and discussion-based approaches that help learners “learn how to learn,” adapt, and innovate in changing contexts. A balanced curriculum should combine science, mathematics, arts, crafts, languages, literature, culture, games, sports, fitness, and value education. This approach aims to build character, empathy, and ethical responsibility while preparing students for meaningful employment. Core components include:

- **Environmental Education:** climate change, biodiversity, waste management, sustainability.
- **Value-Based Education:** humanistic, ethical, constitutional values, life skills, service.
- **Global Citizenship Education (GCED):** awareness of global challenges and promotion of peace, inclusivity, and sustainability.

Students should actively connect theory with practice through internships with local industries, businesses, artists, and research institutions. Such exposure strengthens

employability while promoting multidisciplinary engagement in real-world contexts.

**Research, Innovation, and Multidisciplinary Universities**

To drive research and innovation, Higher Education Institutions (HEIs) will establish incubation centres, technology hubs, interdisciplinary research centres, and industry-academic linkages. Research will extend beyond sciences to humanities and social sciences, aligning with a multidisciplinary approach. Special emphasis will be placed on public health, epidemiology, virology, vaccinology, and other pandemic-related research.

**MERUs (Multidisciplinary Education and Research Universities)**

will serve as model institutions, comparable to IITs and IIMs, setting global benchmarks for quality multidisciplinary education and research. The National Research Foundation (NRF) will support this ecosystem to foster a vibrant culture of inquiry and innovation.

**Drivers of Multidisciplinary Research**

Multidisciplinary research is increasingly driven by a convergence of global and local factors that demand integrated approaches to knowledge and problem-solving. Rapid technological and scientific advancements in areas such as artificial intelligence, big data, machine learning, biotechnology, and climate science are creating demand for new skill sets that span mathematics, data science, and computational modelling. At the same time, pressing socio-environmental challenges—including climate change, pandemics, resource depletion, inequality, and public health crises—necessitate insights from biology, environmental science, public health, sociology, and economics. Policy frameworks and development goals, such as the UN Sustainable Development Goals and national priorities related to clean water, sanitation, inclusive education, energy, and governance reform, further underscore the need for collaborative research across disciplines. Additionally, evolving educational and workforce requirements emphasize critical thinking, creativity, communication, empathy, and problem-solving, highlighting the enduring importance of the humanities and social sciences in shaping holistic responses. Together, these drivers illustrate the essential role of multidisciplinary research in addressing complex, interconnected challenges.

**Table 1:** Integration of Knowledge Domains

Area	Contributions to Research & Policy
Natural Sciences & Technology	Technical solutions, innovations, predictive models, resource management
Social Sciences	Understanding behaviour, governance, policy impacts, and socio-economic factors
Humanities & Arts	Ethics, cultural context, creativity, empathy, social cohesion
Interdisciplinary Linkages	Facilitates holistic solutions, avoids socially or environmentally harmful interventions

Source: Author’s creation

**Mechanisms of Action**

The mechanisms of action for multidisciplinary research operate through interconnected processes that ensure both relevance and impact. Problem-focused research forms the foundation by identifying critical challenges such as

poverty, health disparities, and climate risks, while also examining the complex interactions across economic, social, environmental, and technological systems. Institutional and policy engagement is essential, involving the mapping of administrative structures, interdepartmental responsibilities, and the identification of rigidities, inefficiencies, or governance gaps, alongside the development of evidence-based recommendations for reform and policy design. Equally important is contextual adaptation, which entails localizing global innovations to India’s socio-cultural and environmental contexts to ensure that interventions remain socially inclusive, culturally appropriate, and environmentally sustainable. Finally, feedback and iteration strengthen the process by evaluating the societal and governance impacts of research outcomes and integrating lessons learned to refine future research, policies, and practices. Together, these mechanisms enable multidisciplinary research to address complex challenges with adaptability, inclusivity, and effectiveness.

**Research Outputs**

The outcomes of multidisciplinary research can be seen across multiple domains, reflecting its capacity to bridge technical innovation with social transformation. On the technical front, it generates solutions such as sustainable energy systems, digital platforms for governance, and targeted health interventions. Policy insights emerge in the form of evidence-based recommendations, institutional reforms, and coordinated development strategies that strengthen governance and planning. These efforts translate into tangible societal benefits, including an enhanced quality of life, inclusive development, and equitable access to resources and opportunities. Moreover, multidisciplinary research has a profound educational impact by fostering the development of a workforce equipped with holistic skills—integrating technical expertise with socio-cultural awareness—thus preparing individuals to navigate and address complex, interconnected global and local challenges.

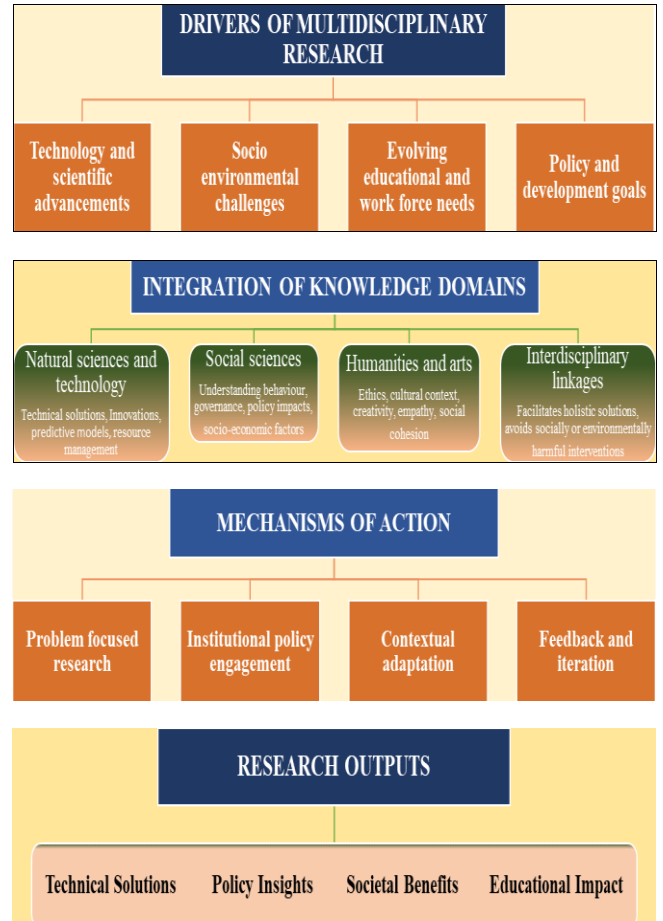
**Guiding Principles**

The guiding principles of multidisciplinary research emphasise the need for integration, adaptability, and inclusivity in tackling today’s complex challenges. A holistic perspective is central, recognising that no single discipline can adequately address multifaceted societal problems. Inclusivity and sustainability ensure that solutions account for social equity while respecting environmental limits. Collaboration is essential, requiring strong partnerships among academia, government, industry, and civil society to co-create knowledge and action. Contextual relevance grounds research in local socio-cultural, environmental, and governance realities, making interventions more effective and meaningful. Finally, continuous learning underscores the importance of iterative adaptation, where research evolves based on societal feedback and observed outcomes. Together, these principles provide a robust framework for impactful multidisciplinary inquiry.

Technological advances impact ethical standards in social science research by introducing complex issues related to data privacy, security, and the long-term implications of research results. The book emphasizes that in the digital era, problems like data security and participant privacy become

more complicated, requiring researchers to thoughtfully incorporate these ethical ideals into various techniques and methodological practices. The evolving nature of technology necessitates ongoing ethical reflection and adaptation to address new challenges such as data security concerns, informed consent in digital environments, and the responsible use of big data and innovative research methods (Feigenblatt, 2025).

**Conceptual Framework for Integrating Disciplines for a Multidisciplinary Approach in Social Science Research**



Source: Author’s creation

This framework positions multidisciplinary research as both a knowledge-generation and problem-solving engine that connects scientific innovation, social understanding, and ethical awareness to drive effective governance and societal development. Solving complex societal challenges requires integrating diverse disciplines, combining technical, scientific, social, cultural, and ethical perspectives. By embedding interdisciplinary into pedagogy, curriculum design, experiential learning, and research ecosystems, India can prepare learners not just to gain knowledge but to apply it collaboratively across domains to generate innovative, sustainable solutions.

**Challenges in Integrating Disciplines for multidisciplinary research in social sciences**

Despite its significant advantages, multidisciplinary research also encounters a range of challenges that can hinder its effective implementation. One major obstacle lies in epistemological differences, as various disciplines are grounded in distinct assumptions about what constitutes

valid knowledge and truth. Methodological conflicts further complicate collaboration, especially when integrating qualitative and quantitative approaches that rely on different research traditions. Achieving universal acceptance of multidisciplinary practices remains difficult, as conventional academic cultures often value specialization over integration. Moreover, the absence of robust educational policies and frameworks to support cross-disciplinary learning limits opportunities for collaboration at the institutional level. Institutional barriers also persist, since funding systems, publication norms, and recognition structures continue to prioritize disciplinary research. To address these issues, deliberate efforts are needed to establish interdisciplinary training programs and research units that can cultivate collaboration, bridge methodological divides, and promote a more inclusive and flexible academic ecosystem.

### Discussion

The convergence of diverse disciplines nurtures critical thinking, creativity, and adaptability—skills that are increasingly essential in a rapidly evolving knowledge economy.

The growing complexity of global and national challenges highlights the urgent need for a multidisciplinary research approach that integrates science, technology, social sciences, and the humanities. Such integration enables a deeper understanding of interconnected issues like climate change, health disparities, and technological transformation while guiding inclusive and sustainable policy responses. Institutional frameworks play a critical role in fostering this approach, as demonstrated by models like the Institute for Bioengineering of Catalonia, which promotes collaboration through open research environments, mentoring systems, and diversity-driven initiatives (Sanchis, 2023) <sup>[7]</sup>. These mechanisms reinforce that effective collaboration extends beyond technical cooperation; it requires cultivating a shared culture of communication, ethics, and mutual respect across disciplines. In the Indian context, the National Education Policy (NEP) 2020 provides a strong foundation for embedding multidisciplinary within higher education by emphasising holistic learning, experiential pedagogy, critical thinking, and research-based assessment (Lakhani, 2024) <sup>[3]</sup>. Together, these frameworks demonstrate that addressing complex societal issues demands not only technical expertise but also ethical awareness, cultural understanding, and social engagement.

However, despite its evident benefits, multidisciplinary research faces several persistent challenges. Epistemological differences among disciplines often create tensions in defining research problems, interpreting evidence, and establishing truth claims. Methodological conflicts between qualitative and quantitative traditions, along with institutional barriers such as rigid funding systems and discipline-focused publication norms, continue to hinder integration. The lack of strong educational and policy frameworks further limits the institutionalisation of interdisciplinary research and training. To overcome these challenges, structural and policy-level reforms are essential—particularly those that incentivise collaboration, support flexible curricula, and encourage the establishment of interdisciplinary research units. Continuous feedback and iterative learning processes should also be embedded in research design to enhance contextual relevance and societal

impact. Moreover, as Feigenblatt (2025) emphasises, technological advancements require ongoing ethical reflection, particularly regarding data privacy, informed consent, and the responsible use of big data in research. Ultimately, multidisciplinary research is not only an academic necessity but also a moral and strategic imperative for sustainable development. By fostering holistic education, institutional integration, ethical reflection, and socially responsive research ecosystems, academia can play a transformative role in addressing the world's most pressing challenges while nurturing a generation of researchers equipped to think critically, act ethically, and innovate collaboratively for the collective good.

### Conclusion

Integrating disciplines in social science research enables a comprehensive understanding of societal problems and the development of holistic solutions. While challenges exist, the benefits of enhanced relevance, contextualisation, and impact make interdisciplinary approaches indispensable. Institutional support, policy that has adaptability, training in mixed methodologies, and collaborative cultures are key to advancing this paradigm. Scientific and technological innovations must be meaningfully integrated with social dimensions; only then can scientific research truly contribute to the well-being of individuals and society as a whole.

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