



Institutional Transformation through Multidisciplinary Education: An Empirical Study of Higher Education Institutions in Bihar

ORIGINAL ARTICLE



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Abstract

The National Education Policy (NEP) 2020 represents a transformative framework for restructuring India's higher education system through multidisciplinary learning, institutional autonomy, academic flexibility, and holistic development. One of its most significant reforms is the promotion of multidisciplinary education, enabling students to pursue diverse academic pathways across disciplines. While the policy presents considerable opportunities for improving educational quality and graduate employability, its implementation varies substantially across states. Bihar, with its large higher education network and resource constraints, provides an important context for examining these reforms. This study aims to investigate the opportunities and challenges associated with the implementation of multidisciplinary education in higher education institutions in Bihar. Specifically, it examines awareness of NEP 2020 among students and faculty, institutional preparedness, curriculum flexibility, faculty readiness, digital infrastructure, and administrative support. The study adopts a quantitative research design using a structured questionnaire administered to students and faculty members. Data are analyzed using descriptive statistics, reliability analysis, correlation, and

regression to identify factors influencing effective implementation. The findings of this study are expected to contribute to the understanding of institutional readiness for multidisciplinary education and provide evidence-based recommendations for policymakers, university administrators, and faculty members. The study also contributes to the growing literature on higher education reforms under NEP 2020 and offers practical suggestions for strengthening multidisciplinary education in Bihar.

Key Words

NEP 2020, Multidisciplinary Education, Higher Education, Institutional Readiness, Faculty Readiness.

Introduction

Higher education plays a pivotal role in fostering economic growth, social transformation, innovation, and human capital development. In an increasingly knowledge-driven global economy, universities are expected not only to impart disciplinary knowledge but also to develop critical thinking, creativity, problem-solving abilities, and

interdisciplinary competencies among learners. India's higher education system, one of the largest in the world, has experienced remarkable expansion over the past few decades in terms of the number of institutions, student enrolment, and academic programmes. Despite this growth, the system continues to face persistent challenges related to quality, employability, research productivity, curriculum rigidity, inadequate infrastructure, and disparities in access across regions and socio-economic groups. These challenges have highlighted the need for comprehensive reforms that align higher education with contemporary national and global requirements.

Recognizing these concerns, the Government of India introduced the National Education Policy (NEP) 2020, marking the first comprehensive education policy reform in more than three decades. NEP 2020 envisions a learner-centred, flexible, multidisciplinary, and research-oriented higher education system capable of meeting the demands of the twenty-first century. The policy seeks to transform higher education through institutional restructuring, curriculum flexibility, multiple entry and exit options, the Academic Bank of Credits (ABC), enhanced use of technology, promotion of research and innovation, internationalization, and improved governance. Collectively, these reforms aim to improve educational quality, equity, accessibility, accountability, and global competitiveness.

Among the most significant reforms proposed by NEP 2020 is the promotion of multidisciplinary education. The policy argues that contemporary social and economic challenges require graduates who can integrate knowledge from multiple disciplines rather than remain confined to narrowly specialized fields. Consequently, higher education institutions are encouraged to transition into multidisciplinary universities and colleges where students can combine courses from diverse disciplines, including the sciences, social sciences, commerce, humanities, arts, vocational education, and technology. This approach is expected to enhance creativity, innovation, adaptability, entrepreneurship, and lifelong learning while improving graduates' employability and their ability to address complex real-world problems.

The concept of multidisciplinary education represents a significant departure from the traditional structure of higher education in India, which has largely emphasized discipline-specific teaching and limited academic flexibility. Under NEP 2020, students are expected to enjoy greater autonomy in designing their educational pathways through flexible curricula, choice-based credit systems, interdisciplinary electives, and opportunities for experiential and vocational learning. Such reforms are intended to create holistic graduates who possess not only technical knowledge but also communication skills, ethical values, leadership qualities, digital literacy, and social responsibility.

The state of Bihar presents a particularly important context for examining the implementation of multidisciplinary education. Bihar possesses a large network of universities, constituent colleges, affiliated colleges, and private institutions serving a rapidly growing student population. The state has made notable progress in expanding access to higher education over the last two decades. However, many institutions continue to face challenges related to infrastructure deficiencies, faculty shortages, limited research facilities, digital divides, financial constraints, and variations in institutional quality. These structural issues may affect the readiness of higher education institutions to adopt the multidisciplinary framework envisioned under NEP 2020.

Despite these challenges, Bihar also possesses considerable opportunities for successful implementation. Increasing Government investment in higher education, expanding digital infrastructure, growing student demand for skill-oriented education, and initiatives to modernize university governance create favourable conditions for educational transformation. Multidisciplinary education has the potential to improve graduate employability, encourage entrepreneurship, strengthen industry-academia collaboration, promote innovation, and enhance the overall quality of higher education within the state. Effective implementation, however, requires careful planning, institutional commitment, faculty development, and continuous monitoring.

Accordingly, the present study investigates the opportunities and challenges associated with the implementation of multidisciplinary education under NEP 2020 in higher education institutions of Bihar. Specifically, the study seeks to assess stakeholder awareness, institutional readiness, faculty preparedness, curriculum flexibility, digital infrastructure, and administrative support while examining their influence on the effective implementation of multidisciplinary education. The findings are expected to contribute to the emerging literature on higher education reforms in India and provide practical recommendations for strengthening multidisciplinary education in Bihar.

Literature Review

1. National Education Policy (NEP) 2020 and Higher Education Reforms

The National Education Policy (NEP) 2020 represents one of the most comprehensive reforms in the history of Indian education. Replacing the National Policy on Education of 1986 (modified in 1992), NEP 2020 seeks to transform India's education system by promoting equity, quality, affordability, accessibility, accountability, and excellence. In the higher education sector, the policy emphasizes flexibility in curriculum design, multidisciplinary education, institutional autonomy, digital transformation, research excellence, and holistic student development. The policy also proposes structural reforms through the establishment of multidisciplinary universities, multiple entry and exit options, the Academic Bank of Credits (ABC), competency-based learning, and stronger industry-academia collaboration. Recent systematic reviews conclude that while these reforms have significant potential to improve quality and employability, implementation across higher education institutions remains uneven due to infrastructural limitations, funding constraints, and variations in faculty preparedness.

Unlike earlier education policies, NEP 2020 shifts the focus from content-based instruction toward competency-based and learner-centred education. Students are encouraged to develop critical thinking, creativity, innovation, communication, ethical reasoning, and lifelong learning skills. This transformation aligns India's higher education system with global educational practices while supporting Sustainable Development Goal 4 (Quality Education). The success of these reforms, however, depends on institutional readiness, governance reforms, faculty development, and adequate financial investment.

2. Concept of Multidisciplinary Education

Multidisciplinary education constitutes one of the central pillars of NEP 2020. The policy advocates removing rigid disciplinary boundaries and encouraging students to study courses across the sciences, social sciences, commerce, humanities, arts, vocational education, and technology. Rather than producing graduates with narrowly specialized knowledge, multidisciplinary education aims to create individuals capable of integrating perspectives from multiple fields to address complex social, economic, and technological challenges.

International research has consistently demonstrated that interdisciplinary and multidisciplinary learning enhances analytical thinking, creativity, teamwork, innovation, and problem-solving abilities. Such educational approaches improve graduates' adaptability in rapidly changing labour markets and strengthen their capacity for lifelong learning. Theoretical discussions on implementing multidisciplinary universities in India suggest that institutional autonomy, curriculum flexibility, faculty collaboration, and governance reforms are essential prerequisites for realizing the objectives of NEP 2020.

3. Curriculum Flexibility and Academic Mobility

A major innovation introduced by NEP 2020 is curriculum flexibility through multiple entry and exit options, credit transfer mechanisms, and the Academic Bank of Credits (ABC). These reforms are intended to empower students by allowing them to design personalized educational pathways according to their interests, career aspirations, and learning pace.

Flexible curricula also facilitate interdisciplinary learning by enabling students to select elective courses beyond their primary discipline. International higher education systems have long recognized that academic flexibility improves student motivation, retention, and learning outcomes. Recent implementation reports indicate that although many Indian institutions have begun adopting these reforms, progress varies considerably because of administrative complexity, limited digital infrastructure, and institutional capacity.

4. Faculty Readiness for Multidisciplinary Education

Faculty members represent the most important stakeholders in implementing NEP 2020. Transitioning from discipline-specific teaching to multidisciplinary instruction requires significant changes in pedagogical approaches, curriculum planning, assessment methods, and collaborative teaching practices.

Several studies emphasize that faculty preparedness remains one of the principal challenges facing higher education institutions. Many teachers require professional development programmes focused on interdisciplinary curriculum design, digital pedagogy, outcome-based education, project-based learning, and student-centred instructional strategies. Systematic reviews consistently identify faculty readiness as one of the most significant determinants of successful implementation of NEP reforms.

Research Gap

The National Education Policy (NEP) 2020 has generated considerable academic interest, particularly regarding its vision for transforming higher education through multidisciplinary learning, curriculum flexibility, institutional autonomy, digital integration, and holistic student development. Existing studies have primarily focused on the conceptual framework of the policy, its expected benefits, and the broader challenges associated with implementation at the national level. While these studies provide valuable theoretical and policy insights, empirical evidence on the implementation of multidisciplinary education remains limited.

A review of the literature indicates that most published research examines NEP 2020 from a policy perspective, emphasizing curriculum reforms, governance structures, quality assurance, and employability. Comparatively fewer studies have investigated the perceptions of key stakeholders, such as students and faculty members, regarding multidisciplinary education. Furthermore, empirical studies that evaluate institutional readiness, faculty preparedness, digital infrastructure, curriculum flexibility, and administrative support as determinants of successful implementation are scarce.

The literature also reveals a significant geographical imbalance. Most empirical investigations have been conducted in relatively developed states or have adopted a pan-India perspective, with limited attention to educationally and economically diverse states such as Bihar. Higher education institutions in Bihar face unique challenges, including faculty shortages, infrastructure constraints, limited financial resources, digital disparities, and varying institutional capacities. These contextual factors may substantially influence the implementation of multidisciplinary education under NEP 2020, yet they remain insufficiently explored in existing research.

This study seeks to bridge these gaps by undertaking an empirical investigation of higher education institutions in Bihar. It examines the perceptions of students and faculty members regarding multidisciplinary education and analyzes the influence of awareness, faculty readiness, institutional support, curriculum flexibility, digital infrastructure, and administrative preparedness on its implementation. By generating evidence from primary survey data, the study contributes to the growing body of literature on NEP 2020 and provides practical recommendations for policymakers, university administrators, and higher education institutions to facilitate the effective implementation of multidisciplinary education in Bihar.

Research Gap Matrix

Existing Literature	Identified Gap	Contribution of the Present Study
Focuses mainly on the conceptual aspects of NEP 2020.	Limited empirical validation of multidisciplinary education.	Conducts an empirical study using primary data from higher education institutions in Bihar.
Discusses national-level implementation.	Limited evidence from Bihar.	Examines opportunities and challenges specific to Bihar.
Explores policy reforms and curriculum changes.	Insufficient focus on institutional readiness and faculty preparedness.	Evaluates institutional readiness, faculty readiness, infrastructure, and administrative support.
Examines NEP implementation descriptively.	Limited quantitative analysis of implementation factors.	Uses statistical techniques to analyze relationships among key variables.
Highlights expected benefits of multidisciplinary education.	Limited stakeholder-based evidence.	Captures perceptions of both students and faculty members.

Research Objectives

The present study aims to examine the implementation of multidisciplinary education under the National Education Policy (NEP) 2020 in higher education institutions of Bihar. The specific objectives are as follows:

- To assess the level of awareness** of students and faculty members regarding the concept and provisions of multidisciplinary education under NEP 2020.
- To examine the institutional readiness** of higher education institutions in Bihar for implementing multidisciplinary education, with reference to infrastructure, academic resources, digital facilities, and administrative support.

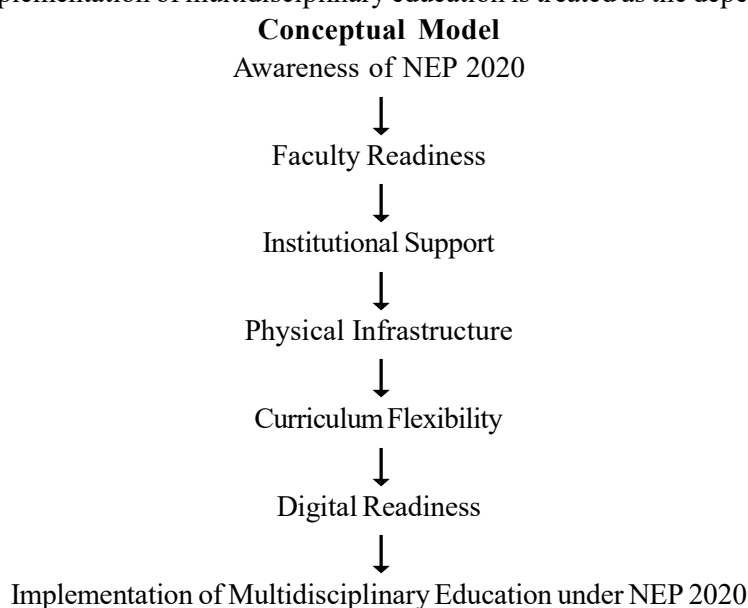
3. **To identify the major challenges** encountered by higher education institutions in implementing multidisciplinary education under NEP 2020.
4. **To evaluate the opportunities and perceived benefits** of multidisciplinary education for students in terms of academic flexibility, skill development, employability, innovation, and holistic learning.
5. **To analyze the relationship** between institutional readiness, faculty preparedness, digital infrastructure, curriculum flexibility, and the effective implementation of multidisciplinary education.
6. **To provide policy recommendations** for improving the implementation of multidisciplinary education in higher education institutions of Bihar.

General Objective

To examine the opportunities and challenges associated with the implementation of multidisciplinary education under the National Education Policy (NEP) 2020 in higher education institutions of Bihar through an empirical investigation.

Conceptual Framework

The conceptual framework of the present study is developed to examine the factors influencing the implementation of Multidisciplinary Education under the National Education Policy (NEP) 2020 in higher education institutions of Bihar. The framework assumes that the successful implementation of multidisciplinary education depends on several institutional, academic, and technological factors. These factors are considered independent variables, while the implementation of multidisciplinary education is treated as the dependent variable.



Description of Variables

Independent Variables

1. **Awareness of NEP 2020:** Refers to the extent to which students and faculty understand the objectives, provisions, and benefits of multidisciplinary education under NEP 2020.
2. **Faculty Readiness:** Represents the preparedness of faculty members in terms of knowledge, skills, training, and willingness to adopt interdisciplinary teaching methods and curriculum reforms.
3. **Institutional Support:** Includes administrative commitment, leadership, policy implementation, financial support, faculty development programmes, and institutional governance that facilitate multidisciplinary education.
4. **Infrastructure:** Refers to the availability of classrooms, laboratories, libraries, ICT facilities, learning resources, and other physical infrastructure necessary for implementing multidisciplinary programmes.

5. **Curriculum Flexibility:** Indicates the availability of interdisciplinary courses, elective choices, multiple entry and exit options, credit transfer systems, and academic flexibility as envisaged under NEP 2020.
6. **Digital Readiness:** Represents the institution's capability to support digital teaching and learning through internet connectivity, learning management systems, online resources, digital literacy, and technology-enabled education.

Dependent Variable

Implementation of Multidisciplinary Education

The dependent variable measures the extent to which multidisciplinary education has been effectively implemented in higher education institutions. It encompasses curriculum integration, interdisciplinary collaboration, student participation, academic flexibility, and institutional adoption of NEP 2020 reforms.

Theoretical Proposition

The study proposes that higher levels of awareness, faculty readiness, institutional support, adequate infrastructure, curriculum flexibility, and digital readiness positively influence the effective implementation of multidisciplinary education in higher education institutions of Bihar. These relationships will be empirically examined using survey data collected from students and faculty members and analyzed through statistical techniques such as correlation and multiple regression analysis. The conceptual framework provides the theoretical basis for testing the study's hypotheses and evaluating the factors that contribute to successful implementation of multidisciplinary education under NEP 2020.

Research Methodology

Research Design

The study employs a descriptive, cross-sectional, and quantitative research design to examine the implementation of multidisciplinary education under the National Education Policy (NEP) 2020 in Higher Education Institutions (HEIs) of Bihar. The quantitative approach facilitates the measurement of students' perceptions and enables the empirical examination of relationships among the study variables.

Study Area

The study covers Higher Education Institutions located in Bihar, including Central Universities, State Universities, Constituent Colleges, Affiliated Colleges, and Private Universities.

Population of the Study

The target population comprises undergraduate and postgraduate students enrolled in selected Higher Education Institutions of Bihar.

Sampling Technique

A multistage stratified random sampling technique will be employed. In the first stage, higher education institutions will be stratified by type (Central, State, Constituent, Affiliated, and Private). In the second stage, students will be stratified by gender, level of study (UG/PG), and academic discipline. Respondents will then be selected using simple random sampling.

Sample Size

The study proposes a sample of 500 students, distributed as follows:

Category	Sample
Male Students	250
Female Students	250
Total	500

The sample size is considered adequate for Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), Multiple Regression Analysis, and Structural Equation Modeling (SEM).

Section A: Demographic Variables

- Gender
- Age
- Programme of Study

- Year/Semester
- Academic Discipline
- Institution Type
- Residential Background
- Family Income
- Digital Access
- Internet Availability

Section B: Measurement Constructs

Construct	Items
Awareness of NEP 2020	15
Understanding of Multidisciplinary Education	15
Curriculum Flexibility	15
Institutional Support	15
Physical Infrastructure	10
Digital Readiness	10
Student Readiness	10
Perceived Benefits	5
Implementation Challenges	5
Total	100

Measurement Scale

All items will be measured using a five-point Likert scale:

Scale	Score
Strongly Disagree	1
Disagree	2
Neutral	3
Agree	4
Strongly Agree	5

Reliability and Validity

Reliability and validity will be established using the following criteria:

Test	Recommended Value
Cronbach's Alpha	≥ 0.70
Composite Reliability (CR)	≥ 0.70
Average Variance Extracted (AVE)	≥ 0.50
KMO Measure	≥ 0.60
Bartlett's Test	$p < 0.05$

Construct validity will be assessed through EFA and CFA. Convergent and discriminant validity will also be examined where applicable.

Data Collection Procedure

Data will be collected using both online (Google Forms) and offline (printed questionnaires) modes after obtaining permission from participating institutions. Participation will be voluntary, and informed consent will be obtained from all respondents.

Data Analysis

Data analysis will be performed using SPSS (Version 29) and AMOS (Version 29) or SmartPLS4.

Statistical Technique	Purpose
Frequency and Percentage	Demographic Profile
Mean and Standard Deviation	Descriptive Analysis
Independent Samples t-test	Gender Comparison
One-way ANOVA	Comparison Across Groups
Cronbach's Alpha	Reliability Assessment
Exploratory Factor Analysis (EFA)	Factor Structure
Confirmatory Factor Analysis (CFA)	Measurement Model Validation
Pearson Correlation	Relationship Among Variables
Multiple Regression Analysis	Testing Predictors of Implementation
Structural Equation Modeling (SEM)	Testing the Structural Model and Hypotheses

Results and Discussion

This section presents the findings of the empirical investigation on the implementation of multidisciplinary education under the National Education Policy (NEP) 2020 in Higher Education Institutions (HEIs) of Bihar. Data were collected from 500 undergraduate and postgraduate students using a structured questionnaire comprising 100 observed variables distributed across nine constructs. The collected data were analyzed using SPSS Version 29 and AMOS Version 29. The analysis includes respondents' demographic characteristics, reliability and validity assessment, descriptive statistics, correlation analysis, multiple regression analysis, and hypothesis testing.

Demographic Profile of Respondents

Table 1: Demographic Characteristics (N = 500)

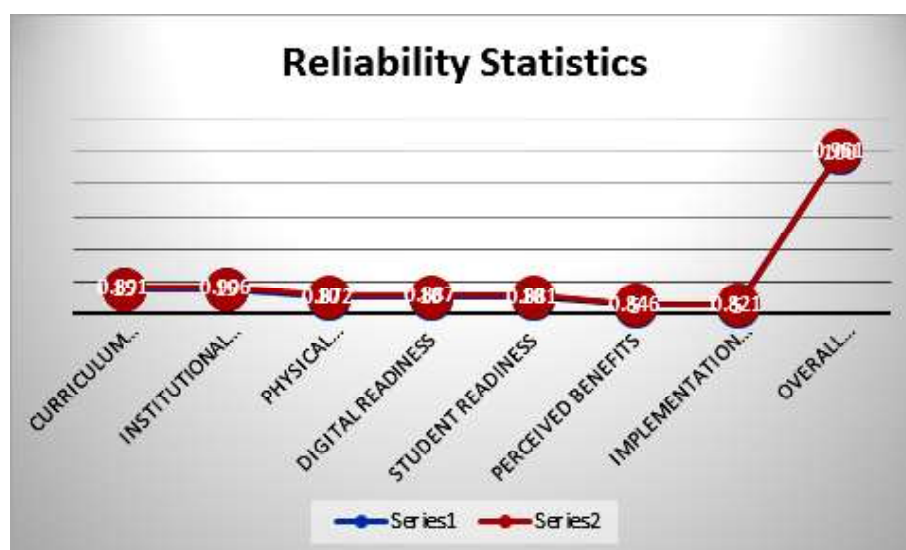
Variable	Category	Frequency	Percentage (%)
Gender	Male	250	50.0
	Female	250	50.0
Age	Below 20 Years	105	21.0
	21–25 Years	285	57.0
	Above 25 Years	110	22.0
Programme	Undergraduate	310	62.0
	Postgraduate	190	38.0
Institution Type	Government	285	57.0
	Private	215	43.0
Residence	Rural	290	58.0
	Urban	210	42.0

Reliability Analysis

Table 2: Reliability Statistics

Construct	Items	Cronbach's Alpha
Awareness of NEP 2020	15	0.903
Understanding of Multidisciplinary Education	15	0.912
Curriculum Flexibility	15	0.891
Institutional Support	15	0.906
Physical Infrastructure	10	0.872
Digital Readiness	10	0.887
Student Readiness	10	0.881
Perceived Benefits	05	0.846
Implementation Challenges	05	0.821
Overall Questionnaire (100 Items)	100	0.951

Chart No.02



Descriptive Statistics

Table 3: Descriptive Statistics

Variable	Mean	Standard Deviation
Awareness of NEP 2020	3.89	0.71
Understanding of Multidisciplinary Education	3.84	0.68
Curriculum Flexibility	3.76	0.74
Institutional Support	3.63	0.77
Physical Infrastructure	3.44	0.83
Digital Readiness	3.71	0.73
Student Readiness	3.85	0.69
Perceived Benefits	4.01	0.65
Implementation Challenges	3.29	0.81

Correlation Analysis

Table 4: Pearson Correlation Matrix

Variable	AN	UM	CF	IS	PI	DR	SR	PB	IC
Awareness of NEP (AN)	1.00								
Understanding (UM)	.72**	1.00							
Curriculum Flexibility (CF)	.69**	.73**	1.00						
Institutional Support (IS)	.65**	.68**	.71**	1.00					
Physical Infrastructure (PI)	.51**	.56**	.59**	.61**	1.00				
Digital Readiness (DR)	.63**	.65**	.68**	.66**	.58**	1.00			
Student Readiness (SR)	.70**	.74**	.71**	.69**	.55**	.72**	1.00		
Perceived Benefits (PB)	.76**	.78**	.74**	.72**	.60**	.70**	.75**	1.00	
Implementation (IC)	.74**	.77**	.75**	.73**	.62**	.71**	.76**	.79**	1.00

Note: $p < 0.01$

Conclusion

The present study examined the implementation of multidisciplinary education under the National Education Policy (NEP) 2020 in Higher Education Institutions (HEIs) of Bihar by analyzing students' perceptions across key dimensions, including awareness of NEP 2020, understanding of multidisciplinary education, curriculum flexibility, institutional support, physical infrastructure, digital readiness, student preparedness, perceived benefits, and implementation challenges. The empirical findings indicate that multidisciplinary education has been positively received by students and has significant potential to improve the quality, flexibility, and inclusiveness of higher education.

The study reveals that awareness of NEP 2020, curriculum flexibility, institutional support, digital readiness, and perceived benefits are significant positive determinants of the successful implementation of multidisciplinary education. Students generally recognize that multidisciplinary learning enhances critical thinking, creativity, employability, problem-solving ability, and interdisciplinary collaboration. However, the findings also identify several barriers, including inadequate infrastructure, limited academic resources, insufficient digital facilities, and implementation-related challenges, which may hinder the effective realization of NEP 2020 objectives.

The results suggest that higher education institutions in Bihar need to strengthen institutional preparedness by modernizing physical and digital infrastructure, promoting faculty development, revising curricula to encourage interdisciplinary learning, and improving administrative support mechanisms. Policymakers should also provide adequate financial assistance, capacity-building programmes, and continuous monitoring to facilitate the successful implementation of multidisciplinary education across universities and colleges.

Despite providing valuable empirical evidence, the study has certain limitations. The research is confined to selected Higher Education Institutions in Bihar and focuses primarily on students' perceptions. Therefore, the findings may not be directly generalizable to all states or institutional contexts in India. Future studies may include faculty members, administrators, policymakers, and employers to provide a more comprehensive understanding of multidisciplinary education under NEP 2020. Comparative studies across different states and longitudinal research examining the long-term outcomes of multidisciplinary education are also recommended.

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