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Multidisciplinary Education in Teacher Education: Pre-Service Teachers' Perceptions, Professional Development, and Institutional Support

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Abstract

Teacher professional development is increasingly shaped by the need for interdisciplinary and holistic approaches aligned with contemporary educational reforms. In this context, the National Education Policy 2020 advocates the integration of multidisciplinary learning within teacher education to enhance pedagogical effectiveness, critical thinking, and learner outcomes. The present study investigates pre-service teachers' perceptions of multidisciplinary education with particular reference to professional development and institutional support.

The study employed a convergent mixed-method research design involving 75 pre-service teachers from teacher education institutions. Quantitative data were collected using a structured Likert-scale questionnaire, while qualitative insights were obtained through open-ended responses. The instrument demonstrated excellent internal consistency reliability (Cronbach's $\alpha = 0.957$). Descriptive statistical analysis revealed generally positive perceptions toward multidisciplinary education (Mean range: 2.04–2.67), with comparatively higher scores in professional readiness and lower scores in teaching practice implementation. Thematic analysis identified major concerns including insufficient practical exposure, structural limitations, inadequate interdisciplinary integration, and lack of institutional mentoring.

Triangulated findings indicate a substantial gap between conceptual understanding and practical implementation. Although pre-service teachers exhibit favorable attitudes toward multidisciplinary pedagogy, their operational readiness remains limited due to systemic and pedagogical constraints. The study highlights the need for structured institutional frameworks, experiential teacher preparation, technology-integrated pedagogical training, and strengthened mentorship models to effectively realize the objectives of multidisciplinary teacher education envisioned in NEP 2020.

Keywords: Multidisciplinary Education, Pre-Service Teachers, Professional Development, Institutional Support, Mixed-Method Research, Teacher Education, TPACK.

1. INTRODUCTION

The transformation of teacher education in the twenty-first century necessitates a shift from discipline-centric instructional models toward integrated and multidisciplinary pedagogical frameworks. Contemporary educational paradigms increasingly emphasize critical thinking, creativity, collaboration, and problem-solving abilities, all of which require the synthesis of knowledge across disciplines and contexts (Drake & Reid, 2020).

Globally, multidisciplinary education has emerged as a significant approach for fostering holistic learner development and contextual understanding. Within the Indian educational landscape, the National Education Policy 2020 foregrounds multidisciplinary and holistic education as a foundational principle for educational transformation. The policy envisions teacher education institutions as dynamic spaces capable of integrating content knowledge, pedagogy, technology, and experiential learning to prepare competent educators for diverse classroom realities.

The policy further advocates flexibility in curriculum design, interdisciplinary learning opportunities, integration of vocational and skill-based education, and technologically enriched pedagogical practices. Consequently, pre-service teachers are expected not only to possess disciplinary expertise but also to develop competencies related to collaboration, innovation, reflective practice, and integrated teaching-learning approaches.

However, despite policy-level emphasis and institutional reforms, the practical implementation of multidisciplinary education within teacher preparation programmes remains inconsistent. Existing research indicates that many pre-service teachers demonstrate theoretical awareness regarding interdisciplinary pedagogy but experience difficulty translating these concepts into classroom practice (Darling-Hammond et al., 2017). Limited institutional support, inadequate practical exposure, fragmented curricula, and insufficient mentorship further widen the

gap between conceptual understanding and pedagogical enactment.

Additionally, the growing relevance of technology-integrated pedagogy necessitates the incorporation of frameworks such as Technological Pedagogical Content Knowledge (TPACK), which emphasizes the interconnected relationship between technology, pedagogy, and content knowledge. Nevertheless, teacher education programmes frequently remain tool-oriented rather than pedagogically integrated, limiting the development of authentic multidisciplinary competencies.

In this context, the present study seeks to investigate pre-service teachers' perceptions regarding multidisciplinary education, examine its influence on professional development, evaluate institutional support mechanisms, and identify the challenges associated with practical implementation. Through a mixed-method approach, the study aims to provide empirical insights into the theory-practice gap within multidisciplinary teacher education and contribute to the evolving discourse surrounding educational reforms and teacher preparedness.

2. Review of Literature

Multidisciplinary education is rooted in constructivist and sociocultural theories of learning, which emphasize contextual understanding, experiential engagement, and collaborative knowledge construction. Vygotsky (1978) highlighted the importance of social interaction and contextual learning in cognitive development, thereby laying the theoretical foundation for integrated pedagogical approaches.

According to Beane (1997), curriculum integration promotes meaningful learning experiences by connecting knowledge across subject boundaries and encouraging learners to relate academic concepts to real-life situations. Such integrated approaches foster learner engagement, conceptual understanding, and reflective thinking.

Recent studies conducted between 2021 and 2024 further emphasize the significance of multidisciplinary education in enhancing cognitive flexibility, collaborative learning, creativity, and real-world problem-solving abilities. Research by Sharma and Gupta (2022) revealed that while teacher educators acknowledge the value of interdisciplinary pedagogy, implementation is often hindered by inadequate institutional frameworks, limited collaboration opportunities, and insufficient practical training.

Similarly, studies on teacher professional development indicate that effective teacher preparation requires practice-based learning experiences, mentorship support, and reflective pedagogical engagement (Darling-Hammond et al., 2017). Pre-service teachers who engage in experiential and collaborative learning environments

demonstrate greater adaptability and pedagogical confidence in implementing integrated teaching approaches.

The TPACK framework proposed by Koehler and Mishra (2009) further underscores the importance of integrating technology, pedagogy, and content knowledge in contemporary teacher education. The framework suggests that effective teaching requires an interconnected understanding of subject matter, instructional strategies, and technological tools. However, research indicates that digital competency in teacher education often remains technology-centered rather than pedagogically integrated, thereby limiting meaningful classroom implementation.

Contemporary literature also highlights the influence of institutional support systems in facilitating multidisciplinary education. Supportive academic environments, collaborative learning cultures, mentoring structures, and flexible curricular frameworks significantly contribute to professional readiness and innovative teaching practices among pre-service teachers.

Despite growing scholarly attention toward multidisciplinary education and teacher preparedness, limited empirical research specifically examines the relationship between perceptions, professional development, and institutional support within Indian teacher education institutions. The present study attempts to address this gap through an integrated mixed-method investigation.

3. Conceptual Framework

The present study is grounded in a multidimensional conceptual framework integrating three interrelated dimensions:

- Perceptions of Multidisciplinary Education
- Institutional Support and Resources
- Professional Development Outcomes

The framework conceptualizes multidisciplinary teacher education as an interactive process wherein institutional support mechanisms influence professional development, which subsequently affects pedagogical implementation and teaching practice.

The study assumes that:

- Institutional support enables professional growth and pedagogical innovation.
- Professional development influences classroom implementation and instructional effectiveness.
- Teacher perceptions mediate the relationship between conceptual understanding and practical application.

The framework further aligns with the principles of the National Education Policy 2020 and the TPACK model, emphasizing holistic, technology-integrated, and learner-centered pedagogy.



Figure 1: Multidisciplinary Teacher Education Framework

4. Objectives of the Study

1. To examine pre-service teachers' understanding of multidisciplinary education.
2. To analyze the role of multidisciplinary education in professional development.
3. To evaluate institutional support for multidisciplinary practices.
4. To identify challenges associated with implementation in teaching practice.
5. To triangulate quantitative and qualitative findings to understand the theory-practice relationship.

5. Methodology

5.1. Research Design

The study employed a convergent mixed-method research design integrating quantitative and qualitative approaches to obtain comprehensive insights into pre-service teachers' perceptions and experiences regarding multidisciplinary education.

5.2. Sample

The sample consisted of 75 pre-service teachers enrolled in teacher education institutions. Participants were selected using convenience sampling due to accessibility and institutional feasibility.

5.3. Tools for Data Collection

The following tools were utilized:

- Structured Likert-scale questionnaire
- Open-ended qualitative response schedule

The questionnaire was designed to assess perceptions related to professional development, institutional support, digital competency, and teaching practice.

5.4. Validation and Reliability of the Tool

The research instrument underwent expert validation to ensure content relevance, conceptual clarity, and alignment with study objectives. Necessary modifications were incorporated based on expert suggestions.

Measure	Value	Interpretation
Cronbach's Alpha	0.957	Excellent Reliability

Inference

The exceptionally high Cronbach's alpha value indicates strong internal consistency among the questionnaire items, confirming that the instrument reliably measures perceptions related to multidisciplinary education and teacher professional development.

5.5. Ethical Considerations

Participants were informed regarding the academic purpose of the study, and voluntary participation was ensured. Confidentiality and anonymity of responses were maintained throughout the research process.

6. Data Analysis and Findings

6.1. Quantitative Analysis

Table 1: Descriptive Statistics

Variable	Mean	SD	Variance	Interpretation
Professional Readiness	2.67	0.99	0.98	Strong positive perception
Institutional Support	2.33	0.98	0.95	Moderate but inconsistent
Digital Competency	2.25	1.00	1.00	Adequate but varied
Teaching Practice	2.04	0.94	0.87	Weak implementation

In-depth Interpretation

The quantitative findings indicate an overall positive attitudinal orientation toward multidisciplinary education among pre-service teachers. The comparatively higher mean score for professional readiness suggests that respondents perceive multidisciplinary learning as beneficial for enhancing pedagogical competencies, adaptability, and professional growth.

However, the relatively lower mean score for teaching practice indicates a persistent disconnect between conceptual preparedness and pedagogical enactment. Although participants acknowledge the significance of integrated learning approaches, many experience difficulty implementing such practices during internships and classroom engagement.

Institutional support demonstrates moderate scores, reflecting the presence of certain enabling mechanisms while simultaneously indicating inconsistencies in mentorship, infrastructure, and collaborative opportunities. Similarly, digital competency findings suggest varying levels of technological preparedness, reinforcing the need for pedagogically integrated technology training rather than isolated digital skill acquisition.

6.2. Qualitative Analysis (Thematic Coding)

Table 2: Themes and Interpretation

Theme	Code	Representative Phrase	Interpretation
Training Gap	PTG	"We don't know how to apply it"	Lack of practical exposure
Structural Barriers	SCB	"Time is limited"	Institutional constraints
Student Engagement	SEL	"Students show more interest"	Positive learning impact
Integration Difficulty	PDI	"Linking subjects is hard"	Pedagogical challenge
Institutional Need	ISR	"Need proper guidance"	Systemic support gap

Interpretation

The qualitative findings reinforce the quantitative data by highlighting the persistent theory-practice divide within teacher education. Participants expressed strong conceptual acceptance of multidisciplinary approaches but simultaneously emphasized difficulties associated with practical implementation.

Responses particularly reflected concerns regarding insufficient training opportunities, limited interdisciplinary collaboration, time constraints during internships, and inadequate mentorship support. At the same time, participants acknowledged that multidisciplinary teaching approaches positively influence learner engagement, classroom interaction, and contextual understanding.

6.3. Triangulation of Findings

Dimension	Quantitative Findings	Qualitative Findings	Integrated Interpretation
Awareness	High	Basic conceptual clarity	Positive understanding
Skills	Moderate	Training gap identified	Partial professional readiness
Practice	Low	Lack of exposure	Significant implementation gap
Institutional Support	Moderate	Need for guidance and structure	Fragmented support mechanisms

Triangulated Insight

The integration of quantitative and qualitative findings reveals that pre-service teachers exhibit favorable perceptions and theoretical understanding regarding multidisciplinary education; however, their operational readiness remains constrained by structural, pedagogical, and institutional limitations.

The triangulated findings particularly indicate that awareness alone is insufficient for effective pedagogical implementation. Structured mentoring, experiential learning opportunities, interdisciplinary collaboration, and institutional support systems are necessary to bridge the gap between theory and practice.

7. Discussion

The findings of the present study reveal a complex relationship between teacher perceptions, institutional

support, and practical implementation of multidisciplinary education. The overall positive perceptions observed among respondents align with the vision articulated in the

National Education Policy 2020, which advocates holistic, flexible, and integrated teacher preparation.

The comparatively higher scores related to professional readiness indicate that pre-service teachers recognize the pedagogical and professional value of multidisciplinary learning. This finding corroborates the work of Darling-Hammond et al. (2017), who emphasized that collaborative and practice-oriented teacher education contributes significantly to professional competence and reflective teaching.

However, the relatively lower scores related to teaching practice reveal a substantial implementation gap. This finding aligns with Sharma and Gupta (2022), who identified inadequate practical exposure, fragmented curricula, and limited institutional support as major barriers to interdisciplinary teaching practices in Indian educational contexts.

The qualitative findings further reinforce the argument that teacher education institutions often emphasize conceptual understanding without providing sufficient opportunities for authentic classroom integration. Participants' responses regarding lack of mentorship, structural constraints, and difficulty linking disciplines indicate the necessity of practice-based professional preparation.

The study also highlights the importance of integrating the TPACK framework within multidisciplinary pedagogy. Although respondents reported moderate digital competency, technology integration frequently remained procedural rather than pedagogically meaningful. This observation supports the findings of Koehler and Mishra (2009), who argued that effective technology integration requires the intersection of technological, pedagogical, and content knowledge.

The strong reliability coefficient (Cronbach's $\alpha = 0.957$) enhances the credibility and internal consistency of the study findings. Furthermore, the mixed-method design enabled deeper exploration of both measurable perceptions and contextual experiences, thereby strengthening interpretative validity.

Overall, the study emphasizes that successful implementation of multidisciplinary teacher education requires systemic reforms encompassing curriculum restructuring, institutional collaboration, experiential learning opportunities, mentorship support, and pedagogically integrated technology training.

8. Key Findings

- Pre-service teachers demonstrate high awareness regarding multidisciplinary education.
- Respondents perceive multidisciplinary approaches as beneficial for professional growth and pedagogical development.
- Institutional support mechanisms are present but remain inconsistent and fragmented.
- Significant challenges persist in translating conceptual understanding into classroom practice.
- A substantial theory–practice gap exists within teacher education programmes.
- Technology integration remains more tool-oriented than pedagogically integrated.

- Structured mentorship and experiential learning opportunities are essential for effective implementation.

9. Recommendations

For Teacher Education Institutions

- Develop structured interdisciplinary curriculum modules.
- Strengthen mentorship and supervision during teaching internships.
- Encourage collaborative lesson planning across disciplines.
- Integrate reflective teaching practices within training programmes.

For Policy Implementation

- Provide clear implementation frameworks aligned with the National Education Policy 2020.
- Allocate institutional resources for interdisciplinary innovation and faculty development.
- Promote collaboration between schools and teacher education institutions.

For Teacher Professional Development

- Emphasize experiential and practice-based learning approaches.
- Integrate pedagogically meaningful technology training based on the TPACK framework.
- Conduct workshops focusing on interdisciplinary lesson design and implementation.

10. Conclusion

The study concludes that multidisciplinary education possesses transformative potential within teacher education by promoting holistic learning, professional adaptability, collaborative thinking, and pedagogical innovation. Pre-service teachers demonstrate positive perceptions regarding the value and relevance of multidisciplinary approaches in contemporary educational settings.

However, the findings simultaneously reveal a substantial gap between conceptual understanding and practical implementation. While respondents exhibit awareness and acceptance of interdisciplinary pedagogy, institutional limitations, insufficient practical exposure, fragmented support systems, and inadequate mentorship constrain effective classroom application.

The successful realization of multidisciplinary teacher education envisioned by the National Education Policy 2020 therefore requires systemic, pedagogical, and institutional reforms. Strengthening experiential learning opportunities, collaborative professional development, structured mentorship, and technology-integrated pedagogical training can significantly enhance operational readiness among future educators.

The study ultimately contributes to the evolving discourse on teacher education reform by emphasizing the necessity of bridging the theory–practice divide through integrated and practice-oriented educational frameworks.

11. References

- [1] Beane, J. A. (1997). *Curriculum integration: Designing the core of democratic education*. Teachers College Press.

- [2] Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). Sage Publications.
- [3] Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). *Effective teacher professional development*. Learning Policy Institute.
- [4] Drake, S. M., & Reid, J. L. (2020). Integrated curriculum as an effective way to teach 21st-century capabilities. *Asia Pacific Journal of Educational Research*, 3(1), 31–50.
- [5] Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge (TPACK)? *Contemporary Issues in Technology and Teacher Education*, 9(1), 60–70.
- [6] Ministry of Education. (2020). *National Education Policy 2020*. Government of India.
- [7] Sharma, R., & Gupta, P. (2022). Challenges and opportunities in implementing multidisciplinary education in India. *International Journal of Educational Research and Innovation*, 17, 112–126.

