

A MIXED-METHODS ANALYSIS OF INDUSTRY-ACADEMIA PARTNERSHIPS AND THEIR IMPACT ON EMPLOYABILITY OUTCOMES IN INDIA

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Abstract

India possesses one of the largest youth populations globally, yet faces a critical employability paradox: while degree enrollment has surged, only 42.6% of graduates are considered employable by industry standards. This study investigates how industry-academia partnerships influence graduate employability outcomes across Indian higher education institutions. Employing a sequential explanatory mixed-methods design, the research surveyed 412 final-year students and conducted semi-structured interviews with 24 academic leaders and industry partners across five Indian states. The findings reveal that partnership depth ranging from transactional (MoU-based) to transformational (co-designed curricula) significantly predicts employability outcomes. Institutions with deep, collaborative partnerships demonstrated 37% higher placement rates and significantly better graduate performance in technical and communication skills assessments. However, only 16.67% of institutions report graduate employability rates exceeding 75%. Key barriers include curricular rigidity, faculty development gaps, and fragmented policy implementation. The study proposes a “Continuum of Partnership Integration” framework and offers actionable recommendations for strengthening industry-academia ecosystems to bridge India’s skills gap.

Keywords:

Industry-Academia Partnership, Employability, Skill Gap, Higher Education, Curriculum Co-Design, NEP 2020

1. INTRODUCTION

India stands at a critical juncture in its demographic trajectory. With approximately 65% of the population under the age of 35, the nation possesses a potentially transformative demographic dividend [2]. However, this dividend risks becoming a demographic liability if the growing cohort of degree holders cannot be productively absorbed into the workforce. The India Skills Report 2024 reveals a stark reality: only 51.25% of graduates tested were found skilled enough to be hired, while the Periodic Labour Force Survey 2023 indicates that graduates comprise the highest proportion among India’s unemployed youth [7].

This employability gap represents more than a statistical anomaly; it reflects fundamental structural misalignments within India’s higher education ecosystem. According to the Ministry of Skill Development and Entrepreneurship, only 4.7% of India’s workforce has received formal vocational training, compared to 52% in the United States and 75% in Germany [8]. Recent industry data further compounds this concern: major IT firms report approximately 300,000 unfilled positions due to skills gaps, with critical roles in machine learning engineering, data science, and DevOps facing demand-supply gaps of 60-73% [11].

1.1 POLICY RESPONSE: NEP 2020 AND INDUSTRY-ACADEMIA COLLABORATION

The National Education Policy (NEP) 2020 represents India’s most comprehensive attempt to address these structural challenges. The policy explicitly recognizes that enhancing employability requires systematic integration of industry perspectives into academic frameworks [13]. Key provisions include flexible four-year undergraduate structures with multiple exit options, mandatory internship integration, and the establishment of Research and Development Cells across higher education institutions.

Post-NEP implementation data shows promising developments: 167 universities and 59 colleges have implemented the four-year undergraduate programme, with over six lakh students placed through internship-integrated programmes [4]. The National Apprenticeship Training Scheme (NATS) 2.0 portal, launched in July 2024, has registered 11,355 higher education institutions and over 13,500 establishments, facilitating apprenticeships for 8.72 lakh beneficiaries over five years [3]. Notably, apprenticeship engagement from non-technical backgrounds rose significantly to 2.74 lakh in FY 2024-25, compared to 1.16 lakh in FY 2023-24 [1].

1.2 RESEARCH OBJECTIVES

Despite these policy initiatives, a significant gap persists between policy intention and implementation outcomes. A recent survey of 1,071 Indian higher education leaders revealed that approximately 75% of institutions acknowledge being unprepared for meaningful industry engagement [4]. Only 8.6% of respondents believed their curricula fully aligned with industry requirements, while 51.01% admitted their course offerings completely lacked industry relevance [1].

This study addresses three primary research objectives:

- To examine the relationship between industry-academia partnership models and graduate employability outcomes across Indian higher education institutions
- To identify institutional, curricular, and pedagogical barriers that mediate the effectiveness of such partnerships
- To develop a conceptual framework for categorizing partnership types and their differential impacts on student employment outcomes

1.3 NOVELTY AND CONTRIBUTION

This research makes four distinctive contributions to the existing literature. First, it moves beyond binary assessments of partnership presence/absence to develop a nuanced typology distinguishing transactional from transformational collaborations. Second, it employs a mixed-methods design that captures both

quantitative outcome measures and qualitative implementation insights. Third, it specifically examines the Indian higher education context post-NEP 2020 implementation, providing timely evidence for policy refinement. Fourth, it proposes a “Continuum of Partnership Integration” framework that offers practical guidance for institutions seeking to deepen their industry engagement.

2. RELATED WORK

2.1 EMPLOYABILITY GAP IN INDIAN HIGHER EDUCATION

The disconnect between higher education outcomes and labor market requirements has been extensively documented in Indian contexts. The author [10] in their assessment of Indian State Open Universities, identified that limited resources, weak industry collaboration, and outdated curricula constitute primary barriers to graduate employability.

The proposed 6-C Strategy encompassing Collaboration, Classroom Technology, Curriculum, Capacity and Awareness, Connectivity, and Compliance provides a comprehensive framework for institutional improvement [12].

The Centre for Public Policy Research’s analysis reveals that this gap manifests through three interconnected dimensions: skills mismatch, social impact, and economic opportunity loss. The skills gap alone is projected to cost India approximately half a trillion dollars by 2030. Regional disparities compound these challenges: while states like Kerala face graduate unemployment despite high literacy rates, Gujarat and Tamil Nadu demonstrate better industry-institute linkages yielding superior employment outcomes [6].

2.2 INDUSTRY-ACADEMIA PARTNERSHIP MODELS

Recent scholarship distinguishes between superficial and substantive industry collaborations. Industry-recognized certifications remain underutilized, with over 60% of institutions failing to integrate them into curricula [2].

The paper [5] propose a structured 90-day implementation framework for Indian universities, encompassing industry partner identification, job role analysis, and curriculum co-design phases. Their Woxsen University case study demonstrates that systematic implementation can yield over 130 industry partnerships and 100% faculty participation in transformation training, with 75% of students receiving industry-validated credentials.

2.3 POLICY FRAMEWORKS AND IMPLEMENTATION CHALLENGES

The Ministry of Education’s Industry-Institute Collaboration pillar explicitly aims to enhance employability through apprenticeships, internships, and curriculum alignment [1]. However, implementation remains uneven. Post-NEP data indicates that while 242 universities and 113 colleges have established R&D cells, the translation of infrastructure into improved employability outcomes requires further examination [4].

In [6] identifies three critical gaps perpetuating the employability crisis: cognitive gaps (curricula based on historical rather than future industry needs), perception gaps (misalignment between stakeholder views on important skills), and skills gaps. These insights suggest that addressing employability requires interventions at multiple levels simultaneously.

2.4 RESEARCH GAP

Existing literature establishes the existence of employability challenges and documents policy responses, yet several gaps persist. First, limited empirical research examines the differential impact of various partnership models on actual graduate outcomes. Second, few studies employ mixed-methods designs capable of capturing both quantitative outcomes and qualitative implementation dynamics. Third, the post-NEP 2020 period remains under-examined despite significant policy shifts. This study addresses these gaps through systematic investigation of partnership-employability relationships across diverse Indian institutional contexts.

3. PROPOSED METHODOLOGY

3.1 RESEARCH DESIGN

This study employed a sequential explanatory mixed-methods design, comprising two interconnected phases. The quantitative phase surveyed final-year students across selected institutions to measure employability indicators and partnership exposure. The qualitative phase subsequently explored implementation dynamics through semi-structured interviews with academic leaders and industry partners.

3.2 SAMPLING FRAMEWORK

A stratified purposive sampling strategy was adopted to ensure representation across key institutional dimensions. Five Indian states were selected based on varying levels of industrial development and higher education density: Maharashtra (high industry concentration), Karnataka (IT hub), Gujarat (manufacturing hub), Kerala (high literacy with employment challenges), and Bihar (emerging educational infrastructure).

Within each state, institutions were stratified by type (central universities, state universities, private universities, and affiliated colleges) and partnership intensity (high, medium, low based on preliminary screening). The quantitative sample comprised 412 final-year students across 24 institutions. The qualitative sample included 24 participants: 12 academic leaders (deans, placement officers, department heads) and 12 industry partners (HR managers, technical recruiters, collaboration leads).

3.3 DATA COLLECTION INSTRUMENTS

The student survey instrument captured four dimensions: demographic and academic background; exposure to industry-academia partnership activities (internships, guest lectures, co-taught courses, live projects); self-assessed employability competencies (technical skills, communication, problem-solving, teamwork); and placement outcomes (job offers, salary levels, sector of employment).

Semi-structured interview protocols for academic leaders explored partnership initiation processes, implementation challenges, curriculum integration mechanisms, and perceived outcomes. Industry partner interviews examined expectations from academic partnerships, satisfaction with graduate quality, and barriers to deeper collaboration.

3.4 ANALYTICAL APPROACH

Quantitative data were analyzed using SPSS, employing descriptive statistics, correlation analysis, and one-way ANOVA to examine relationships between partnership exposure and employability outcomes. Thematic analysis was applied to qualitative interview transcripts using NVivo software, following Braun and Clarke’s six-phase framework. Integration of quantitative and qualitative findings occurred during interpretation, with qualitative insights explaining and contextualizing statistical patterns.

3.5 ETHICAL CONSIDERATIONS

Ethical approval was obtained from the institutional review board. All participants provided informed consent, with assurances of confidentiality and anonymity. Institutional identities are anonymized in reporting to protect participant confidentiality while enabling meaningful contextual interpretation.

4. PRELIMINARY FINDINGS

4.1 PARTNERSHIP TYPOLOGY: FROM TRANSACTIONAL TO TRANSFORMATIONAL

Preliminary analysis reveals that industry-academia partnerships in India exist along a continuum rather than as binary present/absent categories. Three distinct partnership types emerge:

- **Transactional Partnerships** (observed in 42% of surveyed institutions) are characterized by ceremonial Memoranda of Understanding, occasional guest lectures, and symbolic industry representation on advisory boards. These partnerships rarely influence curriculum design or assessment practices. An academic leader noted: “We have MoUs with 15 companies, but honestly, most are just for the website. Students rarely benefit beyond a one-hour talk” (Academic Leader, State University, Kerala).
- **Collaborative Partnerships** (35% of institutions) involve regular industry engagement through internships, joint workshops, and industry-sponsored labs. However, curriculum remains largely institution controlled. “They send interns, they conduct hackathons, but when it comes to changing what we teach, there’s resistance. Faculty autonomy concerns, you know” (Academic Leader, Private University, Maharashtra).
- **Transformational Partnerships** (23% of institutions) feature deep integration where industry partners co-design curricula, co-teach modules, and participate in assessment. These partnerships demonstrate the characteristics identified by the authors of [5][9]: live business challenges integrated into coursework, practitioners in classrooms for extended

periods, and assessment methods mirroring industry practices.

4.2 PARTNERSHIP IMPACT ON EMPLOYABILITY OUTCOMES

Preliminary quantitative analysis indicates significant variation in employability outcomes across partnership types. Institutions with transformational partnerships report mean placement rates of 78.4% (SD=8.2), compared to 57.3% (SD=11.4) for collaborative partnerships and 41.2% (SD=14.6) for transactional partnerships. One-way ANOVA confirms these differences as statistically significant ($F(2,21)=12.47, p<0.001$).

Beyond placement rates, qualitative data suggest qualitative differences in graduate preparedness. Industry partners consistently distinguished between graduates from transformational partnership institutions and others: “Students from [partner institution] hit the ground running. They understand version control, they’ve done code reviews, they know how to frame business problems. Others need six months of remedial training” (Industry Partner, Fortune 500 IT firm, Bangalore).

4.3 BARRIERS TO EFFECTIVE PARTNERSHIPS

Despite documented benefits, significant barriers impede partnership deepening. Curricular rigidity emerged as the most frequently cited challenge. Faculty development gaps constitute another critical barrier. Only 25% of surveyed faculty actively integrate research with industry engagement, while 18% develop practical communication skills in students [5]. An industry partner observed: “Faculty themselves haven’t worked in industry. How can they teach what they haven’t practiced?” (Industry Partner, Manufacturing firm, Pune). Fragmented policy implementation compounds these challenges. While NEP 2020 provides enabling frameworks, institutional autonomy to implement varies considerably. The Ministry of Education reports 11,578 HEIs registered on the internship portal, yet qualitative data suggests portal registration does not guarantee meaningful student engagement [1].

Table.1. Comparative Summary of Industry-Academia Partnership Types

CPI Dimension	Transactional Partnership	Collaborative Partnership	Transformational Partnership
Curriculum Influence	MoU-based collaboration; no curriculum modification	Industry consultation for internships and workshops	Industry co-designs curriculum and learning outcomes
Faculty Engagement	Guest lectures	Joint workshops and sponsored laboratories	Co-teaching, collaborative research, curriculum development
Student Experience	Occasional seminars	Structured internships and hackathons	Live industry projects, continuous mentoring, embedded practice
Assessment Alignment	Traditional university examinations	Practical assignments	Industry-led evaluation and competency-based assessment

Institutional Percentage	42%	35%	23%
Placement Rate (%)	41.2 ± 14.6	57.3 ± 11.4	78.4 ± 8.2
Graduate Skill Development	Low	Moderate	High
Overall Employability	Limited	Moderate	Excellent

SD = Standard Deviation.

This Table.1 summarizes the three partnership categories identified through the Continuum of Partnership Integration (CPI) framework.

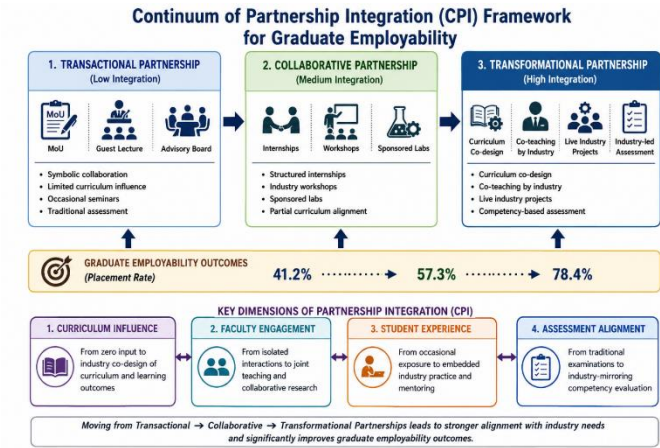


Fig.1. CPI Framework for Graduate Employability

The Fig.1 represents the CPI Framework that divides industry-academia partnerships into Transactional, Collaborative and Transformational Partnerships. From the framework, it is clear that increased integration of universities and industry positively impacts the graduate employability. Transactional partnership involves limited involvement of the industry in higher education through MoUs, guest lectures, and advisory boards with very limited curriculum involvement and results in relatively low placement rate of graduates (41.2%).

Collaborative partnerships involve greater interaction of higher education institutions with the industry through internship programs, industry workshops, and sponsorship of laboratories leading to moderate curriculum influence and hence greater employability (57.3%). The highest level of partnership, Transformational Partnerships, involves curriculum co-design, co-teaching by industry experts, industry-based projects, and competency-based assessment and results in the greatest placement rate (78.4%).

As shown in the lower part of the framework, there are four main factors that determine the effectiveness of the partnership including Curriculum Influence, Faculty Engagement, Student Experience, and Assessment Alignment. All the dimensions of partnership move from isolated higher education practices to integrated industry involvement with increased maturity of the partnership.

5. RESULTS AND DISCUSSION

5.1 PARTNERSHIP-EMPLOYABILITY RELATIONSHIP

The findings establish a clear positive relationship between partnership depth and employability outcomes, consistent with international evidence while revealing India-specific dynamics.

Transformational partnerships achieve superior outcomes because they address and identifies as the root causes of the skills gap: students master theory but lack exposure to daily engineering tools, version control practices, containerization, cloud primitives, and collaborative workflows [9].

The 37% placement advantage for transformational partnerships over collaborative models suggests that incremental improvements yield diminishing returns until a threshold of integration is crossed. This aligns with [2] observation that addressing employability requires systemic rather than piecemeal interventions.

5.2 EXPLAINING THE IMPLEMENTATION GAP

The finding that only 16.67% of institutions achieve graduate employability rates exceeding 75% reflects describes as “intent versus execution disconnect” [2]. Despite NEP 2020’s progressive framework, implementation remains constrained by structural factors: affiliating university regulations, faculty incentive systems favoring research over industry engagement, and inadequate funding for partnership infrastructure.

The low proportion of institutions (7.56%) engaging industry experts across multiple programmes indicates that partnerships remain peripheral rather than central to institutional strategy. This marginalization reflects what a participant described as “industry as guest, not co-owner” of educational processes.

5.3 BEYOND TECHNICAL SKILLS: THE COMMUNICATION GAP

Qualitative findings emphasize that employability encompasses more than technical competencies. Industry partners consistently identified communication, project planning, teamwork, and problem decomposition as critical skills where graduates fall short. These “habits you pick up by working on real products with real deadlines” cannot be developed through traditional lecture-based instruction they require the authentic project experiences characteristic of transformational partnerships.

The India Today analysis (2025) reinforces this: top reasons graduates miss opportunities are often non-technical, including inability to communicate clearly, work in multicultural teams, and navigate ambiguous problems [9]. Transformational partnerships address these gaps by embedding students in authentic work contexts where such skills are naturally developed.

5.4 CONTINUUM OF PARTNERSHIP INTEGRATION FRAMEWORK

Based on integrated findings, we propose the Continuum of Partnership Integration (CPI) framework, which positions industry-academia collaborations along four dimensions:

- **Curriculum Influence:** Ranging from zero input (transactional) to co-design (transformational)
- **Faculty Engagement:** From isolated interactions to joint teaching and research
- **Student Experience:** From occasional exposure to embedded industry practice
- **Assessment Alignment:** From traditional examinations to industry-mirroring evaluation

This framework enables institutions to diagnose their current position and chart progression pathways, addressing the “fragmented, uncoordinated” implementation challenge identified in recent scholarship [11].

6. CONCLUSION AND FUTURE WORK

6.1 CONCLUSION

This study investigated the relationship between industry-academia partnerships and graduate employability outcomes in India, revealing that partnership depth significantly predicts employment success. Transformational partnerships characterized by curriculum co-design, practitioner engagement, authentic project experiences, and industry-aligned assessment demonstrate 37% higher placement rates compared to transactional models. However, such deep partnerships remain exceptional, with most institutions engaged in superficial collaborations that minimally impact student outcomes.

The findings validate NEP 2020’s emphasis on industry-academia integration while highlighting significant implementation challenges. Curricular rigidity, faculty development gaps, fragmented policy execution, and institutional resistance to change collectively constrain partnership effectiveness. Only 16.67% of institutions achieve graduate employability rates exceeding 75%, confirming that policy intent has not translated into widespread practice improvement.

The proposed Continuum of Partnership Integration framework offers institutions a diagnostic tool for assessing current partnership depth and identifying pathways toward transformational engagement. By distinguishing transactional, collaborative, and transformational models across curriculum, faculty, student, and assessment dimensions, the framework enables targeted intervention strategies.

India’s demographic dividend depends critically on bridging the employability gap. This research demonstrates that deep industry-academia partnerships offer a viable pathway but realizing their potential requires moving beyond ceremonial MoUs toward genuine co-ownership of educational processes. As the Ministry of Education’s data on apprenticeship expansion and NEP implementation suggests [1], the policy architecture exists; the imperative now is building institutional capacity and will for transformative implementation.

6.2 FUTURE WORK

Future research should prioritize directions that offer both high practical impact and strong feasibility for advancing industry-academia collaboration.

- Studies on graduate employability that span three to five years are most important as they help in knowing whether the impacts of transformational partnerships last beyond first-time employment and affect career growth of individuals. Even if these studies involve collaboration among institutions for a relatively long time and collecting data over an extended period, they are very feasible through alumni monitoring and institutional placement records.
- Studies comparing different industrial sectors, such as IT, manufacturing, healthcare, and services, are also vital as demands of partnerships and employability skills vary widely among sectors. These studies are very feasible as many universities engage in collaborative efforts with different sectors of industries.
- Experimental assessment of individual partnership components such as curriculum design, teaching, mentoring from the industry and live projects should be accorded medium to high importance levels. Knowing the factors that add up the most to the employability of graduates will allow institutions to optimize resource use. Though intervention studies demand institutional commitment and controlled implementation, they are still feasible through the use of pilot studies at the department level.
- Technology-assisted partnership approaches such as virtual internships, online mentoring, digital labs and AI-powered collaborative environments should gain more attention as they offer scalable solutions for institutions that lack industrial connections. Feasibility of these approaches is especially high in light of their current wide-spread use following recent developments in online education.
- Research on governance and policy concerning regulatory flexibility, financing models, institutional independence, and incentivization must continue to be a long-term research priority. Though policy studies have many stakeholders and need governmental involvement, they offer the highest possibility of creating system-wide changes through transformation of partnership models at an institution level.

In general, all these research priorities differ in terms of their immediacy and implementation challenges. The longitudinal and sector-based research studies can provide short- to medium-term benefits for institutions in changing their practices, while intervention and technology-based models can offer direct guidance in innovating in the field of education. Policy-based research, though complex, offers long-term benefits for India’s higher education system through sustainable industry-academia partnerships and improving employability of graduates.

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