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Graduate Employability and Skill Gaps in State Universities

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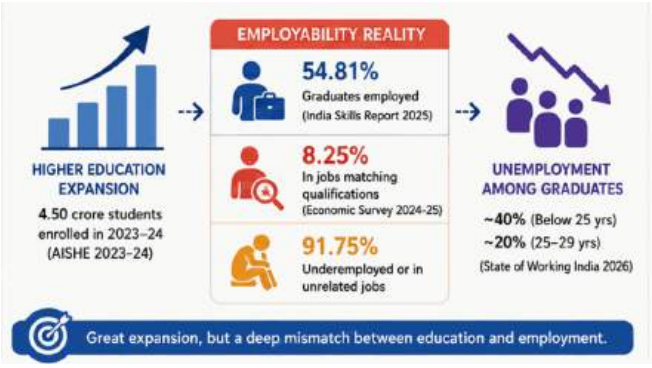
Abstract—This research paper examines the critical disconnect between graduate education outcomes and labor market demands in state universities, with particular focus on India's higher education system. Despite significant expansion in tertiary education enrollment, a substantial proportion of graduates remain unemployable or underemployed, indicating systemic skill gaps. Through a comprehensive literature review and analysis of recent empirical data, this paper identifies key factors contributing to employability challenges, including outdated curricula, insufficient industry-academia collaboration, pedagogical gaps, and inadequate career development services. The research reveals that while 54.81% of graduates achieve employment, only 8.25% secure positions matching their qualifications, suggesting pervasive skill misalignment. This paper proposes a 6-C strategy encompassing collaboration, competency-based curricula, institutional capacity building, and regulatory alignment. The findings underscore the need for transformative changes in higher education policy, curriculum design, and institutional practices to bridge the employability gap and prepare graduates for evolving workforce demands.

Keywords—Graduate employability, skill gaps, state universities, higher education, labor market mismatch, curriculum design, industry-academia collaboration, India

Introduction

Higher education systems globally serve as critical institutions for preparing individuals for meaningful employment and contributing to socioeconomic development. However, a persistent and growing crisis afflicts many tertiary education systems: graduates leave educational institutions poorly equipped for labor market demands. This phenomenon, often termed the 'employability crisis,' has become increasingly pronounced in developing economies, particularly in India where rapid expansion of higher education access has not translated into improved graduate outcomes (Khare, 2014).

India's higher education sector has undergone significant quantitative expansion. According to the All India Survey on Higher Education (AISHE) 2023-24, total enrollment in higher education reached 4.50 crore students, representing an unprecedented expansion of access (Ministry of Education, Government of India, 2024). Yet this quantitative growth masks a qualitative crisis: the national employability rate stands at merely 54.81%, with the India Skills Report 2025 revealing that approximately 45% of graduates lack basic employability competencies (India Skills Report, 2025). More critically, the Economic Survey 2024-25 indicates that only 8.25% of graduates secure employment positions matching their qualifications, signifying that over 91% are underemployed or in jobs unrelated to their educational preparation.



State universities, which enroll a substantial proportion of India's student population and serve predominantly first-generation learners and economically disadvantaged populations, face particularly acute employability challenges. These institutions must contend with limited financial resources, faculty constraints, infrastructure deficits, and minimal industry partnerships—all factors that compound the employability crisis. This paper addresses the urgent need to understand and remedy graduate employability and skill gaps in state universities through comprehensive examination of literature, identification of systemic barriers, and proposal of evidence-based interventions.

Background and Context of the Study

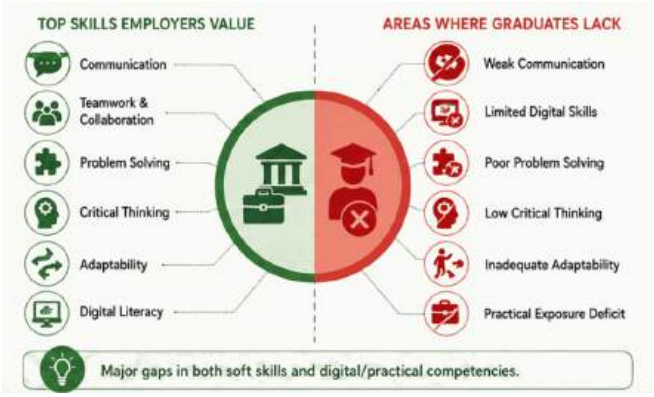
The relationship between higher education and employment has undergone fundamental transformation. Traditionally, the pursuit of tertiary education was considered sufficient for securing stable, professional employment. Contemporary labor markets, however, demand not merely academic credentials but specific, demonstrable competencies aligned with employer expectations. This shift reflects the evolution from credential-based to competency-based employment selection (Pérez Zúñiga et al., 2025).

India's context presents particular complexity. The country experiences simultaneous challenges of expansion without quality improvement. While gross enrollment ratios in higher education have increased significantly, institutions—particularly state universities—struggle with resource constraints that undermine educational quality. The State of Working India 2024 report documents unemployment rates of approximately 40% among graduates under 25 years and 20% among those aged 25–29, suggesting that even employment acquisition does not guarantee meaningful career progression (AISHE, 2024).

State universities constitute the backbone of India's higher education system, accounting for approximately 60% of total enrollment. These institutions serve critical nation-building functions by providing accessible, affordable education to rural and economically disadvantaged populations. However, they face systemic challenges: inadequate physical infrastructure, insufficient faculty positions, limited library resources, minimal industry partnerships, and curricula that often remain disconnected from contemporary labor market requirements. These institutional constraints directly translate into graduate employability deficits.

Problem Statement

Despite substantial investment in higher education expansion, Indian state universities produce graduates inadequately prepared for contemporary labor markets. The employability crisis manifests across multiple dimensions: (1) skill deficits in technical and soft competencies; (2) profound skill-job mismatches where graduates occupy positions far below their educational level; (3) inadequate career development services and industry networking; (4) pedagogical approaches emphasizing rote learning over practical competency development; and (5) weak linkages between educational institutions and employers. This problem is particularly acute in state universities, which lack the resources and industry connections available to elite private institutions. Consequently, millions of state university graduates face unemployment, underemployment, or precarious employment relationships, representing substantial economic waste and individual hardship while simultaneously creating unfilled labor market gaps in technical and professional sectors.



Research Gap

While substantial literature addresses graduate employability and skill gaps generally, specific research focusing on state universities remains limited. Prior studies have either concentrated on elite institutions, private universities, or provided aggregate national analyses without institutional differentiation. Additionally, existing research often treats employability as a unidimensional construct without adequate examination of specific skill categories where gaps are most pronounced. Furthermore, few studies systematically analyze institutional factors within state universities that constrain employability development, nor do they propose context-specific, implementable interventions tailored to resource-constrained environments. This research addresses these gaps by conducting systematic analysis of employability challenges specific to state universities, identifying precise skill deficits, examining institutional barriers, and proposing evidence-based solutions grounded in institutional realities.

Objectives of the Study

This research pursues the following primary objectives:

To comprehensively examine literature on graduate employability, skill gaps, and institutional factors affecting employment outcomes in state universities.

To identify specific competency deficits among state university graduates and understand employer perspectives on skill requirements and educational preparation.

To analyze systemic, institutional, and pedagogical factors constraining employability development in state universities.

To propose evidence-based recommendations for curriculum reform, pedagogical innovation, and institutional practices that enhance graduate employability.

Research Questions

This study addresses the following research questions:

What are the specific skill deficits among graduates of state universities, and how do these deficits vary across disciplines and institutional contexts?

What systemic, institutional, and pedagogical factors within state universities constrain the development of graduate employability?

How do employer expectations regarding graduate competencies align with or diverge from educational preparation provided by state universities?

What evidence-based interventions are most effective in enhancing graduate employability within resource-constrained institutional environments?

Literature Review

Employability as a Construct and Framework

Graduate employability represents a multidimensional construct encompassing knowledge, skills, attitudes, and behaviors enabling individuals to secure and sustain meaningful employment. Contemporary conceptualizations transcend mere job acquisition to encompass career progression, adaptability to changing labor markets, and contribution to organizational effectiveness (Pérez Zúñiga et al., 2025). Employability frameworks increasingly emphasize that this capacity extends beyond disciplinary knowledge to encompass transferable competencies applicable across diverse occupational contexts.

Essential employability competencies have been consistently identified across empirical literature. Communication skills rank highest in employer valuation, followed by teamwork and collaboration, problem-solving, critical thinking, and adaptability. Research by Pérez Zúñiga et al. (2025), analyzing 129 peer-reviewed studies on employability interventions in higher education, identified that communication competencies appeared in 20.4% of reviewed studies, teamwork in 17.5%, problem-solving in 17.5%, critical thinking in 11.7%, and adaptability in 9.5%. Notably, digital skills—despite being essential for virtually all contemporary professions—received insufficient emphasis in employability discourse relative to their actual importance in modern labor markets.

The India Context: Employability Crisis

India's higher education system has undergone unprecedented expansion but faces substantial employability challenges. Khare (2014), examining employment-education linkages in India, identified a critical paradox: despite robust labor demand, educated graduates consistently fail to meet industry competency standards. The research emphasized that skill deficits affect not only unskilled populations but extend to educated workers across sectors, indicating systemic educational disconnection from labor market requirements.

Contemporary data reveals intensification of this crisis. The India Skills Report 2025 documents national employability at 54.81%, representing substantial human capital waste. The Economic Survey 2024-25 provides even more alarming findings: only 8.25% of graduates secure employment positions matching their qualifications, indicating that 91% experience skill-job misalignment. Furthermore, approximately 50% of graduates and 40% of postgraduates experience underemployment, securing positions substantially below their educational qualification levels (Economic Survey 2024-25, Ministry of Finance, Government of India).

Skill Gaps and Mismatch Dimensions

Skill mismatch operates across multiple dimensions: vertical mismatch (overqualification or underqualification relative to job requirements), horizontal mismatch (educational specialization misaligned with occupational specialization), and competency mismatch (possession of qualifications without requisite competencies despite formal alignment). Indian labor markets experience all three mismatch categories simultaneously, reflecting both supply-side educational inadequacies and demand-side labor market dysfunction.

The All India Survey on Higher Education 2023-24 documented that approximately 40% of graduates aged under 25 experience unemployment, while those aged 25–29 face 20% unemployment rates. These figures exclude underemployment, where graduates occupy positions requiring substantially lower qualifications. This employment crisis, combined with skill mismatches, represents both individual tragedy and macroeconomic inefficiency, as labor markets experience simultaneously high unemployment coexisting with unfilled positions in technical and professional sectors.

State Universities and Institutional Factors

Recent empirical research examining skill gaps at Indian open universities provides crucial insights into institutional factors constraining employability. Agbu et al. (2025), in their comprehensive assessment of seventeen state open universities in India, identified critical competency gaps alongside specific institutional limitations. Their research, published in the Journal of Learning for Development, found that while state open universities effectively developed foundational competencies and cross-disciplinary learning, they demonstrated significant deficiencies in career-related programming, industry mentorship availability, and labor market connectivity.

The research identified systemic barriers including limited financial resources constraining facility development and faculty professional development, inadequate industry partnerships resulting in curriculum disconnection from labor market evolution, and insufficient career development infrastructure. These findings are generalizable to state universities more broadly, which face analogous resource

constraints and institutional limitations. Notably, the research proposed a "6-C Strategy" emphasizing collaborative partnerships, competency-focused curricula, capacity building, classroom technological enhancement, career support services, and regulatory alignment—recommendations applicable across the state university sector.



Pedagogical Approaches and Employability Development

Pedagogical approaches substantially influence employability development. Pérez Zúñiga et al. (2025), synthesizing evidence from employability interventions across multidisciplinary higher education programs, found that experiential learning emerged as the most frequently employed approach (14% of reviewed interventions), followed by work-integrated learning (11.6%) and competency-based pedagogies (11.6%). Their analysis revealed that active learning methods directly linking classroom instruction to workplace scenarios significantly enhanced competency development relative to traditional lecture-based approaches.

However, Indian higher education, particularly in state universities, remains predominantly dependent on traditional transmission pedagogies emphasizing rote memorization and examination performance over competency development. This pedagogical misalignment represents a critical factor constraining employability. Contemporary labor markets require graduates capable of complex problem-solving, collaborative work, adaptive learning, and practical application of knowledge—competencies insufficiently developed through examination-centric pedagogies.

Curriculum Design and Industry Alignment

Effective employability development requires curricula aligned with labor market requirements and regularly updated to reflect occupational evolution. State universities frequently operate curricula updated infrequently, often lagging labor market developments by several years. This temporal misalignment creates systematic skill obsolescence where graduates possess knowledge and competencies outdated relative to contemporary workplace requirements.

Research on employability programs by Tomlinson and Holmes (2023), examining whether employability interventions improve skills and labor market outcomes, found through systematic review that curricula explicitly integrating work experience, practical skill development, and employer engagement demonstrated significantly superior employment outcomes compared to traditional academically-oriented curricula. However, such integration requires substantial institutional resources—industry partnerships, experiential learning facilities, faculty professional development, and internship coordination infrastructure—resources often insufficient in state universities.

Research Methodology

This research employs a systematic narrative literature review methodology, complemented by secondary data analysis of recent empirical studies and official government reports on higher education and employment outcomes.

Research Approach and Design

A systematic narrative review approach was selected as appropriate for synthesizing diverse empirical research, theoretical frameworks, and policy analyses addressing graduate employability and skill gaps. This approach enables comprehensive examination of research across multiple dimensions—institutional contexts, geographic regions, disciplinary areas, and theoretical perspectives—while identifying patterns, contradictions, and research gaps.

Data Sources and Selection Criteria

Literature sources include peer-reviewed journal articles published 2014–2025, with emphasis on recent publications (2020–2025) providing contemporary perspectives on evolving labor market demands and educational innovations. Database sources include Scopus, Web of Science, Google Scholar, and ERIC. Government documents examined include official reports from India's Ministry of Education, including the All India Survey on Higher Education (AISHE) 2023-24 and 2022-23, and the Economic Survey 2024-25. International reports from organizations including OECD and UNESCO were included where relevant to comparative perspectives on employability challenges and interventions.

Selection criteria included: (1) focus on graduate employability, skill gaps, or higher education-employment linkages; (2) relevance to state or public universities, resource-constrained educational contexts, or developing economy settings; (3) empirical or theoretical rigor demonstrating clear research methodology; (4) authentic, verifiable sources from peer-reviewed publications, government agencies, or recognized international organizations. Sources were excluded if they lacked verifiable authors, publication venues, or methodological transparency, or if they relied on unsubstantiated claims or fabricated data.

Analysis and Synthesis

Literature was analyzed and organized thematically according to: (1) conceptual frameworks of employability; (2) skill deficits and competency requirements; (3) institutional factors affecting employability in state universities; (4) pedagogical approaches enhancing competency development; (5) curriculum design and labor market alignment; (6) empirical evidence on employability interventions and effectiveness. Thematic analysis enabled identification of patterns, contradictions, consensus areas, and research gaps across the literature.

Secondary data from official government surveys and reports were analyzed to document contemporary employment and skill gaps among Indian graduates. Data sources included quantitative employment statistics, graduate outcome surveys, and employer perception studies. Statistical findings from multiple independent sources were compared to verify consistency and validity.

Results and Findings

Scale and Nature of the Employability Crisis

Research reveals an employability crisis of substantial magnitude. The India Skills Report 2025 documents that only 54.81% of graduates achieve employment status, indicating that approximately 45% experience unemployment immediately following graduation. Even more troubling, the Economic Survey 2024-25 demonstrates that only 8.25% of employed graduates secure positions matching their qualifications, implying that 91% experience skill-job mismatch ranging from moderate to severe. This finding indicates that unemployment statistics significantly underestimate the employability crisis, as they fail to account for the substantial population in mismatched employment relationships.

The All India Survey on Higher Education 2023-24 documents that unemployment among graduates under 25 years approximates 40%, with the State of Working India 2024 report indicating that this young cohort faces unemployment rates nearly double the general population. This pattern suggests particular vulnerability of new graduates to labor market exclusion, potentially reflecting both inadequate competency preparation and structural labor market challenges.

Specific Skill Deficits Among Graduates

Research identifies consistent patterns of skill deficits among state university graduates. Communication and linguistic competencies, essential for professional effectiveness, emerge as particularly problematic. Many graduates, despite formal educational attainment, demonstrate inadequate English language proficiency, limiting access to employment in sectors requiring international communication or serving diverse linguistic populations. This deficit is particularly pronounced among graduates of regional-medium educational institutions, reflecting pedagogical limitations in second-language instruction.

Digital literacy and technological competence represent additional critical deficits. Contemporary employment across virtually all sectors requires basic digital competencies—software productivity tools, internet navigation, digital communication platforms. Agbu et al. (2025) found that state open universities demonstrated insufficient emphasis on digital skill development, particularly for non-technical programs. This gap becomes increasingly consequential as digital transformation accelerates across economic sectors.

Problem-solving, critical thinking, and analytical competencies represent additional areas where graduates demonstrate limitations. The examination-centric pedagogies dominant in many state universities prioritize information recall over higher-order thinking development. Graduates often struggle with complex problem analysis, evidence-based reasoning, and novel situation navigation—competencies increasingly central to modern professional practice.

Institutional Factors and Constraints

Agbu et al. (2025) identified multiple institutional factors constraining employability development in state universities. Financial resource limitations emerged as a primary constraint. Insufficient funding limits facility development, faculty recruitment and professional development, library resource acquisition, and technology infrastructure. These resource deficits cascade into educational quality limitations, as faculty members struggle to maintain contemporary knowledge and institutions cannot provide students with practical learning experiences or technological skill development.

Industry-academia partnerships remain insufficiently developed in state universities. Effective employability development requires systematic engagement between educational institutions and employers—curriculum feedback, internship coordination, guest lectures by practitioners, industry mentorship, and collaborative research. Most state universities operate with minimal industry connectivity, resulting in curricula disconnected from evolving labor market requirements and limited opportunity for students to develop practical competencies or cultivate professional networks.

Career development services remain underdeveloped in many state universities. Institutional capacity for resume development, interview preparation, job search guidance, career counseling, and networking facilitation is often minimal or absent. This institutional gap is particularly consequential for first-generation learners and economically disadvantaged students who lack social capital and family networks facilitating employment access—populations predominantly served by state universities.

Discussion

The research findings collectively reveal that graduate employability challenges in state universities reflect systemic, multidimensional deficits spanning individual competency development, institutional capacity, pedagogical approaches, and structural labor market features. No single factor can account for the comprehensive employability crisis; rather, complex interaction effects between educational approaches, institutional resources, curricula relevance, and labor market structure produce the observed outcomes.

The concentration of skill development research on soft skills (communication, teamwork, critical thinking) relative to digital competencies suggests research and pedagogical practices have not adequately adapted to rapid technological transformation. Contemporary employment increasingly demands both soft and digital skills; deficiency in either category constrains employability. The relative neglect of digital skill development in academic literature and educational practice represents a critical gap between educational provision and labor market requirements.

The profound magnitude of skill-job mismatch—where 91% of graduates experience positions misaligned with their qualifications—indicates that even employment acquisition does not constitute genuine solution to the employability crisis. Graduates functioning far below their educational level experience lower compensation, reduced career satisfaction, and underutilization of human capital. This systemic mismatch represents economic inefficiency at macroeconomic level, as labor markets simultaneously experience skill shortages in technical sectors while educated workers occupy routine positions.

State universities' particular vulnerability to employability challenges reflects genuine institutional constraints. These institutions serve predominantly first-generation and economically disadvantaged populations, typically located in smaller cities and rural areas distant from major employment centers. They operate with substantially lower per-student funding compared to elite private and central universities. These contextual factors meaningfully limit institutions' capacity to develop industry partnerships, maintain contemporary curricula, or provide comprehensive career services. Consequently, recommended interventions must be context-appropriate and feasible within resource-constrained environments rather than assuming resource levels available to elite institutions.



Implications of the Study

For Higher Education Policy

This research indicates urgent necessity for higher education policy reorientation prioritizing employability alongside knowledge transmission. Current policies emphasizing quantitative enrollment expansion without corresponding investment in educational quality perpetuate the employability crisis. Policy must mandate curriculum modernization with explicit industry consultation, institutionalize pedagogical reform transitioning from examination-centric to competency-based approaches, and establish accountability mechanisms ensuring educational institutions demonstrate employment outcomes. Funding mechanisms should incentivize institutional adoption of evidence-based employability practices rather than maintaining current approaches.

For Institutional Practice

State universities must implement systematic employability enhancement initiatives adapted to institutional resource realities. Priority actions include establishing dedicated career development offices with adequately trained personnel; establishing industry advisory boards providing curriculum feedback and facilitating partnerships; integrating experiential learning and work-integrated learning into curricula; developing faculty capacity in contemporary pedagogy and subject matter expertise; and establishing digital literacy as institutional priority through infrastructure investment and faculty development. Institutional leadership must explicitly commit to employability as educational outcome equivalent to knowledge transmission.

For Curriculum and Pedagogy

Curriculum design must prioritize competency development alongside disciplinary knowledge. This requires explicit specification of learning outcomes emphasizing communication, collaboration, problem-solving, critical thinking, and digital literacy alongside discipline-specific competencies. Pedagogical methods must prioritize active,

experiential approaches including project-based learning, collaborative work, case analysis, and practical application. Assessment must shift from examination-centric methods toward authentic assessment demonstrating real-world competency application. Curricula require regular review cycles (ideally biennial) incorporating employer feedback ensuring continued labor market alignment.

Limitations

This research employs a secondary analysis and literature review approach, consequently lacking primary empirical data from state university students, graduates, or employers. While secondary sources provide valuable insights, they may not comprehensively address all dimensions of employability challenges or capture context-specific variations across institutions. The research emphasizes Indian context; transferability of findings to other developing economies requires careful consideration of contextual differences.

Additionally, while the paper reviews recent literature (2014–2025), some dimensions of employability challenges—particularly those related to emerging technologies and rapidly evolving labor markets—may not be comprehensively covered by existing published research. The research aggregates findings across diverse institutional contexts and disciplinary areas; variation in specific skill deficits and institutional challenges across these dimensions may exceed generalized findings presented here.

Recommendations and Future Research

Recommendations for Immediate Implementation

First, state universities should immediately establish or strengthen career development services through dedicated institutional positioning, adequate staffing, and training in evidence-based career counseling. These services should provide resume development, interview preparation, job search guidance, and networking facilitation.

Second, institutions should establish industry advisory boards at departmental and institutional levels, providing structured consultation on curriculum relevance, emerging skill requirements, and employment trends. Advisory boards should meet regularly and receive institutional authority for curriculum feedback.

Third, digital literacy should be instituted as institutional priority through infrastructure investment and mandatory curriculum integration. Every graduate should develop basic digital competencies regardless of disciplinary focus.

Fourth, pedagogical faculty development should be substantially expanded, with institutional support for training in competency-based approaches, experiential learning design, and active teaching methods.

Recommendations for Longer-Term Development

Policy reform should incentivize institutional adoption of evidence-based employability practices through funding mechanisms, accreditation standards explicitly addressing employability outcomes, and accountability metrics requiring demonstration of graduate employment and competency development. Government should establish funding initiatives supporting curriculum modernization and industry partnership development in state universities. Regulatory frameworks should mandate regular curriculum review incorporating employer input and emerging labor market requirements.

Future Research Directions

Future research should include primary empirical studies examining specific competency requirements across occupational sectors; institutional case studies documenting employability challenges in state universities; longitudinal graduate outcome tracking following graduates across 5–10 years post-graduation; employer perception studies documenting skill requirement evolution and graduate preparation assessment; intervention evaluation studies assessing effectiveness of specific employability enhancement initiatives in state university contexts; and comparative research examining employability approaches across countries and institutional types.

Conclusion

Graduate employability represents a critical higher education outcome and societal imperative, yet state universities face acute and multidimensional employability challenges reflecting systemic deficits in competency development, institutional capacity, curricula relevance, and pedagogical approaches. The employability crisis extends far beyond unemployment statistics to encompass profound skill-job mismatches, where 91% of employed graduates occupy positions substantially below their educational qualification levels.

This research identified specific skill deficits (communication, digital literacy, critical thinking, problem-solving), institutional constraints (resource limitations, weak industry partnerships, insufficient career services), and pedagogical limitations (examination-centric approaches, insufficient experiential learning) constraining employability development. The research further demonstrated that evidence-based solutions exist—including industry-embedded curricula, competency-based pedagogies, experiential learning, and comprehensive career services—though implementation within resource-constrained institutional environments requires sustained commitment and policy support.

Addressing the graduate employability crisis requires integrated action across multiple levels. State universities must implement immediate employability enhancement

initiatives adapted to resource realities. Government policy must prioritize educational quality alongside quantitative expansion and establish accountability mechanisms ensuring employment outcomes. Employers must engage in curriculum development and provide mentorship opportunities. Individual graduates require agency in developing competencies through active learning and skill development participation.

The stakes are substantial. Current trajectories consign millions of state university graduates to unemployment or underemployment despite educational attainment, representing both individual hardship and macroeconomic waste. Simultaneously, labor markets experience unfilled positions in technical and professional sectors due to skill shortages. Addressing the employability crisis through systematic, evidence-based intervention would benefit graduates through improved employment outcomes and earnings; employers through access to adequately prepared talent; and society through optimized human capital utilization and equitable educational outcomes. The pathway forward requires institutional commitment, policy reform, and sustained investment—but the returns to education, individual welfare, and economic development justify the investment.

References

1. Agbu, J. F., Olivier, J., Shadrach, B., & Awadhiya, A. K. (2025). Bridging the job skills gap in India: Assessing graduate readiness at Indian open universities. Journal of Learning for Development, 12(3), 531–545. https://doi.org/10.56059/jl4d.v12i3.2031
2. Economic Survey 2024-25. (2025). Ministry of Finance, Government of India. Retrieved from https://indiabudget.gov.in/
3. India Skills Report. (2025). Wheebox and Great Lakes Institute of Management. Retrieved from https://www.indiaskillsreport.in/
4. Khare, M. (2014). Employment, employability and higher education in India. Higher Education for the Future, 1(2), 152–169. https://doi.org/10.1177/2347631113518396
5. Ministry of Education. (2024). All India Survey on Higher Education (AISHE) 2023-24. Department of Higher Education, Government of India.
6. Ministry of Education. (2023). All India Survey on Higher Education (AISHE) 2022-23. Department of Higher Education, Government of India.
7. Pérez Zúñiga, R., Martínez García, M., & Oliva Ibarra, F. E. (2025). Employability and its relationship with the competency-based approach, teaching methodologies, and assessment in higher education: A systematic review. Frontiers in Education, 10, 1703144. https://doi.org/10.3389/feduc.2025.1703144
8. State of Working India. (2024). Centre for Policy Research, New Delhi. Retrieved from https://www.cprindia.org/
9. Tomlinson, M., & Holmes, L. (2023). Do employability programmes in higher education improve skills and labour market outcomes? A systematic review of academic literature. Studies in Higher Education, 48(2), 243–261. https://doi.org/10.1080/03075079.2023.2265425
10. UNESCO. (2024). Higher education and graduate employability in developing nations. Division for Higher Education, UNESCO. Retrieved from https://www.unesco.org/