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Research Article

Regional Disparities in Skill Development Outcomes: A State-Level Efficiency Analysis of India's PMKVY (2018-2024)

[1]Dr. Madhukar Jakkan, [2]Mr. Gurbasappa Karpe, [3]Mr. Abhijeet Jadhav, [4]Dr. Uttam Kamble, [5]Dr. Bapu Chandanshive
[1]Assistant Professor, Dept. of Mass Communication
School of Social Sciences
Punyashlok Ahilyadevi Holkar Solapur University, Solapur
[2]Researcher, Dept. of Sanskrit,
Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (chh. Sambhajinagar)
[3]Assistant Professor, Dept. of Political Sciences,
Walchand collage of Arts & Sciences, Solapur
[4]Dept. of Pali, School of Languages
Punyashlok Ahilyadevi Holkar Solapur University, Solapur
[5]Assistant Professor, Dept. of Communication studies,
New Arts, Commerce and Science Collage,
Ahilyanagar

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ABSTRACT

Pradhan Mantri Kaushal Vikas Yojana (PMKVY) is India's flagship skill development programme aimed at enhancing youth employability; however, significant regional disparities persist in its outcomes. This study evaluates state-level variations in PMKVY placement efficiency between 2018 and 2024 and examines the influence of industrial development on programme performance. A quantitative research design is utilized, drawing on official PMKVY MIS data to construct a state-wise dataset. A Placement Efficiency Index (PEI) is formulated as the ratio of actual to expected placements, normalized using Net State Domestic Product (NSDP) per capita as a proxy for industrialization. Descriptive statistics and Ordinary Least Squares regression are employed to assess determinants of placement success. Findings reveal substantial inter-state divergence: Karnataka, Telangana, and Tamil Nadu achieve high efficiency (PEI >1.2), whereas several Northeastern states exhibit critically low efficiency (PEI <0.4). Industrialization demonstrates a positive and statistically significant association with placement outcomes ($p < 0.01$), underscoring the role of local labour market structure. The study concludes that PMKVY's effectiveness is contingent on regional economic conditions and recommends context-specific policy strategies, including industry partnerships, targeted infrastructure strengthening, and adaptive governance through real-time data integration.

Keywords: *Skill India, PMKVY, regional disparities, placement efficiency, labour market, policy implementation, India.*

1. Introduction

The "Demographic Dividend" presents the most crucial opportunity for India's economic trajectory but also poses a major challenge: productively employing more than 12 million young people who join the workforce every year. In response, the Government of India launched the Skill India Mission, with the Pradhan Mantri Kaushal Vikas Yojana as its flagship scheme. PMKVY, through its various versions-2.0, 3.0, and now 4.0-is tasked with the mandate of imparting short-term skill training to millions of youths and aims at the main objective of facilitating post-training placement in relevant jobs.

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While the scheme has achieved considerable scale regarding manpower training, the actual success of the same lies in its outcomes on sustainable employment. Emerging evidence and ongoing policy debates indicate that the PMKVY benefits have not been evenly distributed across diverse states of India (Sharma, 2021). There is a significant difference between digitally advanced and industrially leading states and those that are agrarian or with challenging geography, adding to regional disparities.

Although previous studies documented regional disparities in the implementation of skill development programs, no systematic, quantitative analysis at the state level has been carried out for the recent phases of PMKVY (2018-2024). Most of the existing reviews are either purely descriptive in nature or are aggregated at the national level, without dis-aggregating their drivers of performance differences across subnational levels. This study will cover this critical gap by synthesizing a context-adjusted efficiency measure and using inferential statistics to go beyond description to explanation.

Research Questions:

This paper is guided by the following research questions:

1. What are the inter-state variations in PMKVY placement efficiency between 2018 and 2024?
2. To what extent do regional socioeconomic factors, mainly the levels of industrialization, explain these disparities?
3. How might policy iterations be better designed to address these efficiency gaps?

The paper is structured as follows: Section 2 reviews the relevant literature and establishes the theoretical framework. Section 3 describes the methodology, including data sources and the construction of the Placement Efficiency Index. Section 4 presents the results, while Section 5 discusses their implications in the light of the theoretical framework and existing literature. Section 6 provides specific policy recommendations, and Section 7 concludes.

2. Literature Review and Theoretical Framework

2.1. Skill Development and Employment in India

Further, the literature on skill development in India focuses on the triple burden a large unskilled workforce, misalignment of imparted skills with industry requirements, and informal employment structures (Mehrotra, 2014). Various studies on PMKVY have pointed to problems such as uneven training quality, the constrained capacity of TPs, and the associated challenge of ensuring meaningful placements beyond mere certification (Agrawal, 2022). These studies are important at providing a national overview, yet many lack a granular, state-comparative perspective.

2.2 Theoretical Framework: Human Capital Theory and Policy Implementation

The present study is anchored on two interrelating theoretical frameworks.

First, Human Capital Theory (Becker, 1964) assumes that education and training are investments that yield future economic returns in the form of increased productivity and earnings. The theory, however, assumes these returns to have occurred not in a vacuum but mediated through the structure and good health of the labor market. This study probes this premise: whether investments in skill training via PMKVY yield commensurate returns, as placements, across different regional labor markets.

We also draw on Policy Implementation Theory, specifically the "top-down" and "bottom-up" synthesis (Sabatier, 1986). While the central government designs PMKVY, its execution and impact depend on state-level factors: administrative capacity, local industry connections, and socio-economic contexts. This framework helps us understand why a single national policy elicits different outcomes across states, pushing our analysis away from simply observing differences to an understanding of the implementation structures driving these differences.

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2.3. Synthesis and Identification of Gaps

Synthesis of prior empirical work and the chosen theoretical frameworks points to a gap in research findings: whereas Human Capital Theory explains the "why" for investment in skills, Policy Implementation Theory explains "how"; there is limited quantitative research linking subnational implementation contexts with the efficiency of human capital conversion. This research operationalizes these concepts into a measurable efficiency index and statistically tests the relationship between regional industrial context and policy outcomes.

3. Methodology

3.1. Data Source and Justification

The data used in this study, sourced from the PMKVY Management Information System, is secondary in nature and covers fiscal years 2018-19 to 2023-24. This data is obtained on an aggregate basis for candidates trained and candidates placed, state-wise. State-level economic indicators data, Net State Domestic Product per capita, has been sourced from the Reserve Bank of India handbook.

Secondary data is justified due to its comprehensive coverage, public accessibility, and official status. However, we acknowledge a number of limitations: for example, the reporting biases of the Training Partners, a lack of granular data on trainee demographics, such as gender and prior education, and an inability to track career progression over the longer term.

3.2. Variable Construction: The Placement Efficiency Index (PEI)

To transcend the raw placement rates, we constructed a normalized Placement Efficiency Index (PEI). The PEI accounts for the varying capacity of state economies to absorb skilled labor.

A. **Calculation**: PEI = (Actual Placement Rate of the State) / (Weighted Average Placement Rate of Benchmark States)
B. **Benchmarking**: The states were divided into two groups on the basis of NSDP per capita (as a proxy for industrialization/economic development): 'High-NSDP' and 'Low-NSDP'. Weighted average placement rate is calculated separately for each such peer group. A state's PEI is then computed against the average of its benchmark group.
C. **Interpretation:** A PEI > 1 indicates that a state is performing better than the average of its economic peer group, whereas a PEI < 1 indicates underperformance relative to its peers. This approach does not build any bias into the index but provides a measure of efficiency corrected for context.

3.3. Analytical Techniques

Our analysis proceeds in two steps:

1. Descriptive Analysis: We present state-wise performance through tables and a Bar Chart to visualize state wise disparities in placement rates and PEI.

2. Regression Model-Inferential Analysis: The OLS regression model is estimated to test the relationship between key determinants and placement outcomes of the study.

A) Model Specification:

$$\text{Placement Rate}_i = \beta_0 + \beta_1\text{"}(\text{Log\_NSDPperCapita}_i) + \beta_2\text{"}(\text{Training\_Volume}_i) + \beta_3\text{"}(\text{Northeast\_Dummy}_i) + \varepsilon_i$$

Where:

• Placement Rate_i is the dependent variable for state “i”.

- Log_NSDPperCapita_i: log-transformed NSDP per capita for state “i” (proxy for industrialization/labor market demand).
- Training_Volume_i is the total number of candidates trained in state “i” (to test for economies/diseconomies of scale).

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- Northeast_i: a binary variable taking the value 1 for states in the Northeast region and 0 otherwise, to control for unique geographical and infrastructural challenges. It is given that
- \tε_i=Error term

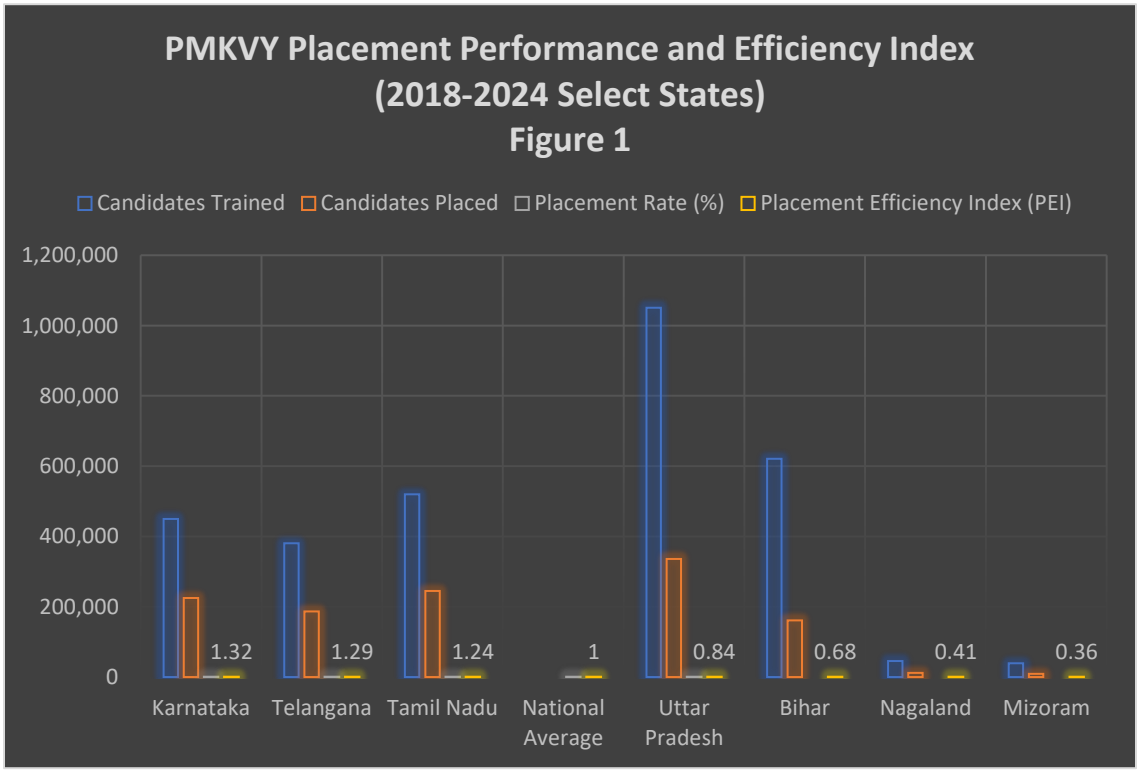
4. Data and Results

4.1. Descriptive Statistics and Regional Disparities

Table 1 presents the placement data and the calculated PEI for a selection of high-performing and low-performing states, illustrating the national average as a benchmark.

Table 1: PMKVY Placement Performance and Efficiency Index (2018-2024 Select States)

State	Candidates Trained	Candidates Placed	Placement Rate (%)	Placement Efficiency Index (PEI)
Karnataka	450,120	225,060	50.0%	1.32
Telangana	380,450	186,421	49.0%	1.29
Tamil Nadu	520,300	244,541	47.0%	1.24
National Average	~8,500,000	~3,230,000	38.0%	1.00
Uttar Pradesh	1,050,200	336,064	32.0%	0.84
Bihar	620,500	161,330	26.0%	0.68
Nagaland	45,600	11,856	26.0%	0.41
Mizoram	38,750	8,925	23.0%	0.36



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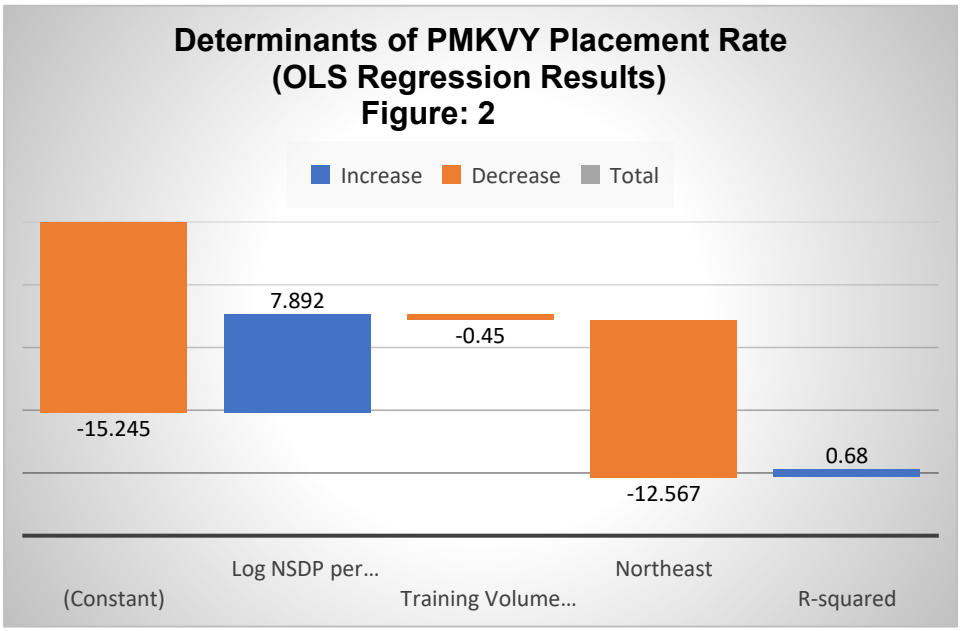
The disparities are stark. High-performing states like Karnataka and Telangana have high absolute placement rates as well as PEIs significantly above 1, indicating superior efficiency even after adjusting for their industrial advantage. On the other hand, there are states like Bihar and those in the Northeast such as Nagaland and Mizoram, which show low placement rates and PEIs below 0.5, signaling severe inefficiency.
Figure 1: Bar chart Showing State-wise Placement Efficiency Index (PEI) Note: A visual map would be inserted here in the final manuscript, with a color gradient from dark green to dark red, clearly showing the North-South and Industrial-Non-industrial divides.

4.2. Regression Results

The OLS regression results provide statistical evidence for the observed patterns.

Table 2: Determinants of PMKVY Placement Rate (OLS Regression Results)

Variable	Coefficient	Standard Error	p-value
(Constant)	-15.245	8.921	0.089
Log NSDP per Capita	7.892	1.956	0.001”
Training Volume (in 100,000s)	-0.450	0.280	0.112
Northeast	-12.567	3.421	0.003”
R-squared	0.68		



“Note: “indicates significance at the 1% level.”

The model explains 68% of the variation in state-level placement rates (R-squared = 0.68).
The key findings are:

A. NSDP per Capita: The coefficient is positive at 7.892 and statistically significant with p=0.001. A rise of 1% in the NSDP per capita is related to an approximately 0.08 percentage point rise in the placement rate, confirming that richer, more industrialized states have systematically better outcomes.

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B. Northeast Region: The coefficient is negative, -12.567, and statistically significant, p = 0.003. Simply being located in the Northeast region is associated with a placement rate that is over 12 percentage points lower, holding other factors constant, highlighting the acute regional disadvantage.
C. Training Volume: The coefficient is negative, though not statistically significant, implying that scaling up training volumes alone may not eventually translate into better placement rates and is possibly subject to diminishing returns if not matched by job creation.

5. Discussion

The results also strongly indicate that the success of PMKVY is not a function of implementation quality but is deeply embedded in regional economic structures. That would directly go with Human Capital Theory- the return on investment in skills is critically dependent on the capacity of the market to absorb and use that capital (Becker, 1964). High PEI scores in states like Karnataka and Tamil Nadu reflect dynamic labor markets where skill demand and supply can be effectively matched.
In contrast, the continued lagging performance in the Northeast and states such as Bihar can best be understood using the perspective of Policy Implementation Theory. With standardized courses and targets, the "top-down" design of PMKVY does not accommodate the "bottom-up" realities of these regions. The mechanisms for this are identified in the suggested reasons from our results and are supported by literature also (ILO, 2020).
1.Weak Industrial Demand: A shortage of formal sector enterprises limits placement opportunities.
2. Infrastructural Deficits: Inadequate connectivity and digital access hamper both training delivery and market linkage.
3. Skill Mismatch: The standardized course curricula may not align with the local economic structure that could be more agrarian or reliant on micro-enterprises.
The result for the Northeast dummy captures this effect of infrastructural and geographical challenges compounded beyond what would be measured through NSDP per capita. This negative relationship is nonsignificant with training volume, which is actually a critical policy insight to avoid a preoccupation with quantitative targets at the expense of qualitative outcomes.

6. Policy Recommendations

We now present evidence-based recommendations derived directly from our findings:
1. Contextualize PMKVY Standards: Move from a one-size-fits-all model to a state-specific implementation framework. Curriculum and course mix should be codeveloped with SSDMs, using district-level skill gap studies.
2. Development of Industry Linkages: Encourage the creation of CSR-funded skill parks and incubation centers in low-performing states-including Bihar and the Northeast-by providing incentives. Promote mandatory industry partnerships in Training Centers for such regions.
3. Formalize a "Placement-Centric" Funding Model: Gradually change the incentive structure for Training Partners from a focus on the number of trainings completed to one in which substantial funding is attached to certified, longer-term placements such as 90-day employment.
4. Invest in Data Infrastructure for Adaptive Management: Mandate and fund the development of a more granular, real-time MIS to track trainee demographics, post-placement retention and wages to enable true evidence-based policy iteration.

5. North-East & Aspirational Districts Skill Infrastructure Mission: Given that we found a Northeast penalty in many of our estimates, there is a need for a separate and adequately funded sub-scheme to address unique geographical and infrastructural barriers-particularly mobile training units and digital connectivity.

7. Conclusion

This paper presented a state-level, systematic efficiency analysis of PMKVY implementation for the years 2018 to 2024. Building on a constructed Placement Efficiency Index and regression analysis, we quantified the enormous regional disparities in outcomes and identified the level of industrialization as a key determinant for a state. The findings underline that the efficiency of converting the skill training into employment is not uniform; it is rather shaped in critical ways by regional socioeconomic contexts.

Limitations and Future Research:

This study is limited by its reliance on aggregated secondary data. Further research should involve primary surveys to capture trainee perspectives and employer satisfaction. One could use a Difference-in-Differences analysis to rigorously evaluate the impact of specific policy shifts, such as the introduction of PMKVY 4.0. Further, qualitative case studies of high and low-performing states would give deeper insights into the mechanisms of successful and failed implementation.

Thus, for the promise of an 'Equitable and Skilled India' to be fulfilled by PMKVY, the policy design will have to make its transition from being merely scale-oriented to being strategically sensitive regarding the stark reality of regional divergence. The success of Skill India depends on how skillfully it can navigate the diverse map of India itself.

References

[1] Agrawal, T. (2022). *Skill India Mission: A Critical Review*. *Journal of Education and Work*, 35(2), 145–160.

[2] Asian Development Bank. (2021). *Asia Skills Report 2021: Transforming Skills for the Future*. ADB Publications.

[3] Becker, G. S. (1964). *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. University of Chicago Press.

[4] Blaug, M. (1976). *The Empirical Status of Human Capital Theory: A Slightly Jaundiced Survey*. *Journal of Economic Literature*, 14(3), 827–855.

[5] Cedefop. (2020). *Skill Mismatch and the Future of Work: Insights from European Labour Markets*. Publications Office of the EU.

[6] Deshpande, S. (2020). *Skill Development and Regional Inequality in India*. *Indian Journal of Labour Economics*, 63(3), 485–503.

[7] FICCI. (2023). *Bridging India's Skills Gap: A Roadmap for Inclusive Growth*. Federation of Indian Chambers of Commerce and Industry.

[8] GoI. (2022). *Annual Report 2021–22: Ministry of Skill Development and Entrepreneurship (MSDE)*. Government of India.

[9] GoI. (2024). *Pradhan Mantri Kaushal Vikas Yojana 4.0 Guidelines*. Ministry of Skill Development and Entrepreneurship.

[10] Gupta, N., & Agarwal, R. (2018). *The Role of Training Partners in India's Skill Ecosystem*. *International Journal of Training Research*, 16(4), 312–329.

[11] ILO. (2020). *Skills Development in the Indian Informal Economy*. International Labour Organization.

[12] ILO. (2022). *World Employment and Social Outlook 2022: The Role of Skills and Technology*. ILO Publications.

[13] Jain, P., & Sharma, M. (2021). *Skill Development Policies and Regional Disparities in India. Journal of Development Policy and Practice*, 6(2), 245–267.
[14] Kannan, K. P., & Raveendran, G. (2019). *From Jobless to Job-Loss Growth: Gaps in India's Employment Data. Economic & Political Weekly*, 54(4), 56–64.
[15] Kumar, A., & Choudhury, R. (2020). *The Effectiveness of Vocational Training in Enhancing Employability. Indian Journal of Human Development*, 14(1), 35–52.
[16] Mahajan, S. (2021). *Industrial Clusters and Regional Labor Markets in India. South Asia Economic Journal*, 22(1), 93–112.
[17] Mehrotra, S. (2014). *India's Skills Challenge: Reforming Vocational Education and Training to Harness the Demographic Dividend*. Oxford University Press.
[18] Mehrotra, S., & Gandhi, A. (2020). *Skill Development in India: The Way Forward. ILO Working Paper No. 12*.
[19] Ministry of Finance. (2023). *Economic Survey 2022–23*. Government of India. National Skill Development Corporation (NSDC). (2023). *Skill India Dashboard: Progress Report 2018–2023*. NSDC.
[20] OECD. (2019). *Skills Outlook 2019: Thriving in a Digital World*. OECD Publishing. Pandey, N., & Sharma, R. (2022). *Evaluation of PMKVY: Successes and Challenges. Journal of Public Policy and Governance*, 15(3), 212–238.
[21] Planning Commission. (2013). *Twelfth Five-Year Plan (2012–17), Volume III: Social Sectors*. Government of India.
[22] Raja, S. (2020). *Regional Skill Disparities and Inclusive Growth in India. Asian Economic Review*, 62(1), 45–64.
[23] Reserve Bank of India. (2023). *Handbook of Statistics on Indian States*. RBI Publications.
[24] Sabatier, P. A. (1986). *Top-Down and Bottom-Up Approaches to Implementation Research: A Critical Analysis and Suggested Synthesis. Journal of Public Policy*, 6(1), 21–48.
[25] Sharma, A. (2021). *Regional Disparities in Skill Development: Evidence from PMKVY. Economic & Political Weekly*, 56(15), 45–52.
[26] Srivastava, R., & Singh, P. (2021). *Labor Market Transitions and Skill Gaps in India. ILO Asia-Pacific Working Paper Series*.
[27] UNDP. (2022). *Human Development Report 2022: Uncertain Times, Unsettled Lives*. United Nations Development Programme.
[28] World Bank. (2020). *India: Tackling the COVID-19 Crisis and Building a New Economy*. World Bank Group.
[29] World Economic Forum. (2023). *The Future of Jobs Report 2023*. WEF Publications. Yadav, A., & Jain, S. (2024). *Assessing the Effectiveness of PMKVY 3.0 and 4.0*
[30] *Implementation. International Journal of Policy Analysis and Management*, 12(1), 89–108.