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Role and Contribution of Pradhan Mantri Kaushal Vikas Yojana in Employment Generation with Special Reference to Nanded District in Maharashtra

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Abstract

Employment-focused skill development is a critical element in India's efforts to tackle youth unemployment and the gap between education and employment. This paper analyzes possible pathways whereby the Pradhan Mantri Kaushal Vikas Yojana (PMKVY) scheme leads to employment in Nanded district, Maharashtra. The analysis is limited to employment status and employability, earnings, placement, gender, residential status and sectoral training. The available documents relating to the employment, labour and vocational training sector published between 2020 and 2025 were reviewed. To demonstrate an extensive quantitative analysis, a synthetic dataset of 300 records, of which 250 were PMKVY records and 50 comparison records, was created. Employment stood at 58.4% and 28.0% for the trained and comparison profiles, respectively. The unadjusted difference was 30.4 percentage points (chi-square $p < .001$). Mean employability scores for the trained and comparison profiles were 62.7 and 49.8, respectively (Welch $p < .001$). The trained profiles reported a mean constructed change in their monthly income of INR 1,904 (paired $t < .001$). It is evident that the design and interpretation of an employment evaluation have been conducted; estimating the real impact of PMKVY in Nanded is not possible with the data analyzed in the current study.

Keywords: *PMKVY; Nanded district; skill development; employability; vocational training; employment generation; Maharashtra*

Introduction

International and national policies define the school-to-work transition in terms of the readiness of young people to take up work and their access to decent employment. The International Labour Organization (ILO) has highlighted in Global Employment Trends for Youth 2024 the continuing concern with regard to young people who remain outside the world of work, education and training (ILO, 2024). India's National Education Policy 2020 also integrates vocational aspects and learning pathways in the education reforms (Ministry of Education, 2020). None of the two policies is an impact evaluation of PMKVY; however they indicate the larger contexts within which the need for assessing the impact of skill development programs on employment and the labour market is anchored.

Employment is not automatically associated with training, and the nature and level of association varies across regions and populations. There is a high level of uncertainty regarding employment, and for young persons, engagement in a vocational program may or may not improve their employment prospects. The employment situation is especially acute among the young population in India who are in the school to work transition and/or are unemployed or underemployed. The India Employment Report 2024 places the employment of young people and the school to work transition at the heart of the policy discourse (ILO & IHD, 2024). Given the context, the employment outcomes associated with training (i.e., earnings and/or employment) need to be assessed over the long-term.

The PMKVY forms an important part of the Skill India mission. Successive phases of the PMKVY scheme focus on vocational training, recognition of prior learning, standard-based certification and institutional mechanisms for mobilization and monitoring. Available Ministry reports, between 2021 and 2025, demonstrate the scales of the scheme's implementation and revisions in its priorities (MSDE, 2022, 2023, 2024a, 2025). The PMKVY 4.0 focuses on demand-side skills, wider access, sectoral relevance and market synchronization (MSDE, 2024b).

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While it is imperative to focus on these design elements for the employment scheme, Nanded is an informative case study district since the intersection of the skill development and mobility infrastructure across the district, as well as differences between town and village labor markets. The 2011 Census-based district population report by the administration is 3,361,292, of which 2,447,394 are rural and 913,898 are urban (District Administration Nanded, n.d.). These data points characterize the population at that time and should not be confused with current projections. The large rural population increases the relevance of transport costs, location of training and proximity to jobs when considering training-to-work transitions.

Employment generation must be measured more carefully than the simple announcement of placements. A person can receive a certificate without ever seeking wage employment, take a job and quit, stay self-employed, or move to another district for employment. Similarly, greater earnings can result from working more, working during peak hours (e.g. because of inflation or changing local conditions), or from changes in the demand for a skill, rather than training. An analytically useful framework describes access, completion, certification, placement support, employment at follow-up, job retention and income. Each of these is an outcome in its own right, and accomplishment of one does not mean accomplishment of the next.

National labor market statistics serve as a benchmark for the evaluation of PMKVY. The latest Periodic Labour Force Survey (2023-24) reports national employment and unemployment estimates based on national definitions (Ministry of Statistics and Programme Implementation [MoSPI], 2024). Its state-level data cannot be extrapolated to the Nanded trainees. The World Bank evaluation of the Skill India Mission Operation (2025b) states that short-term training does not always lead to gainful employment and cautions against the assumption that training can fill the employment gap. These further justify the need to track outcomes beyond administrative certification of training.

A district evaluation should investigate who participates in the training, what competencies are acquired, if participants are able to find gainful employment, and the duration of gainful employment. It should also examine systemic barriers that impede training for women and rural-based people, and people with lower education levels. Comparative figures require special care. People who enrol in PMKVY may have differing motivations, skills, financial resources, and social capital from people who do not enrol. Without reasonable measures for addressing selection into the scheme, any observed differences represent an association and not a causal effect.

This paper has two interrelated objectives. First, evidence critical to a Nanded-focused evaluation is assembled and presented. Second, this paper presents a set of integrated, fully reproducible, numerical, pedagogical examples illustrating a range of testable assertions, supplemented by accompanying Tables, Figures, and Appendices. All examples are pedagogical inputs. The examples are not reports of field observations from residents of Nanded. This distinction is maintained throughout the Results and Discussion section of the paper.

The World Bank's 2021 implementation status report (ISR) for the Skill India Mission notes how the World Bank has worked with District Skill Committees and marginalised groups. It outlines the ongoing administration changes to strengthen skills development institutions (World Bank, 2021). In 2023, the World Bank stated PMKVY was useful to support districts to build end-to-end skilling systems (World Bank, 2023a). In 2025, the World Bank focused on AMBER project, giving insight to the importance to link skills development to employment and to retain (World Bank, 2025a). Taken as a whole, the above mentioned sources, indicate how PMKVY results have supported operationally comparative analyses.

We begin with effective training to increase workers' capacity to do productive work. However, returns to this investment are mediated by labour market institutions and employer demand. The UNESCO (2022) strategy framework for 2022-29 focuses on inclusive transitions to decent work, rather than a strategy to improve TVET enrollment. It gives emphasis on mobility and adaptability of skills.

Bairagya, Bhattacharya and Tiwari (2021) analyzed the microdata from PLFS (Periodic Labour Force Survey) of India, to determine the relationship between formal and informal vocational training and labor force participation of women. Their trivariate-probit approach accounted for the complexity of participation decision and indicated a positive relationship with women's labor market participation. They encourage further gender-sensitive studies, but it does not imply improvement for all PMKVY courses.

Bahl, Bhatt and Sharma (2022) focused on formal and informal vocational education and training in the Indian labor market. The formal modes of training were found to improve the wage and employment prospects of women. Informal modes of training like experiential learning or on-the-job training were found to be less effective in improving the employment and earnings potential of women. The determination of PMKVY is improved if we consider the difference between the above types of skill formation rather than aggregating them. Similarly, the analysis and interpretation of the employment and wage outcome of the training should consider the nature of employment and risks.

Gooptu, Bros and Roy Chowdhury (2023) also studied skill mismatch using PLFS. They spoke about overeducation, training coverage, and misalignment of skill supply and demand. These are especially relevant to the case of Nanded. Although high-quality vocational training may exist, it may be unrelated to the skills required to operate in the available jobs. A survey of the district may also establishing additional employment is the responsibility of other sectoral interventions.

indicate the types of skills required by the available jobs.

Singh, Sidana, Bhat, and Sidana (2022) analyzed data on India's labor market to study the impact of vocational training on women's self-employment. With respect to the PMKVY policy, it is important that mentoring extend beyond the training to assist beneficiaries to establish market linkages, improve their credit and literacy skills, and provide them with relevant tools, and other means of support to access capital, as well as ongoing mentoring. The outcome "working" might encompass a range of activities of different levels of productivity and earnings. The mentoring of the beneficiaries of vocational training should extend beyond the training to place a stronger emphasis on active linkages to the labor market.

Chakravorty and others (2023) studied the impact of the COVID-19 crisis on the transition from school to work among youth in rural India. Their study provides additional evidence to show why the active linkage of youth to the labor market becomes crucial. During normal times, the major shocks that occur in the labor market are demand shocks. It is therefore warranted that a future impact evaluation study on vocational training in Nanded should document the year of the enrollment, the local economic situation, and the time of follow-up to ensure that the differences faced by the beneficiaries are comparable.

In their study, Chakravorty and others (2024) built on their earlier study by testing the integration of psychosocial support into a vocational training program. They found that the placement conditions and the jobs in the labor market play an important role in improving the employability of the participants of the vocational training program. An example of good practice in the field of psychosocial support would be to train vocational course counselors to acquire the necessary skills to counsel on the conditions of the job market, the wages, the characteristics of the employment contracts, and the degree of mobility required, in order to align the job preferences of the candidates with the available jobs in the market.

Thekkumkumara, Jagannathan and Sivakumar (2022) analyse PMKVY's ability to integrate people with mental illnesses into vocational training. This study adds to our understanding of inclusive program design, going beyond rural-urban divide and male/female inclusion. Accessibility of the training centers, accommodations, and supportive job placements can help vulnerable groups to convert their PMKVY training into employment. It is important to do an ethical district level evaluation to identify such accessibility issues, only with voluntary disclosure of sensitive information.

The PMKVY policy document gives additional detail to the studies by describing the PMKVY implementation process, which gives important context. MSDE annual reports provides the institutional and financial framework of PMKVY, and the PMKVY 4.0 guidelines describe the goals and the means to achieve them (2022, 2023, 2024a, 2024b, 2025). Impacts of PMKVY cannot be measured from the documents released by the MSDE alone. It would require analysis and impact evaluation to determine what would happen to comparable individuals in the absence of PMKVY.

From an external vantage point, the ILO/IHD employment report, UNESCO TVET strategy and World Bank's Completion report share a broad similarity. Each argue the need to match skills supply with employment demand (ILO & IHD, 2024; UNESCO, 2022; World Bank, 2025b). Local placements services, course specializations and post-placement supports remain to be answered empirically for Nanded. The research gap is not merely the absence of district level data. It is the absence of independent, verifiable, longitudinal data to evaluate the quality of employment obtained by program participants in relation to the local context.

Objectives and Hypotheses

1. Analyze the channels through which PMKVY promotes employment in Nanded district.
2. Analyze the employment status and employability of trained and comparison profiles.
3. Analyze the pre- and post-training constructed income of trained profiles.
4. Analyze the training, certifications, placements, and employment sectors.
5. Analyze differences by gender, education, age, and residence.
6. Identify main barriers and relevant policies for sustainable employment.

The null hypotheses are: H01, the participation and employment status of PMKVY are independent; H02, the mean employability of trained and comparison groups are the same; H03, the mean within-person change of income of trained profiles is zero; H04, the training and employability are unrelated; and H05, other training and demographic factors combined explain employment status. The corresponding alternatives state that there is association, mean differences, and changes.

Methodology

Research design. The document combines desk-based evaluation of verified policies and labor market publications with illustration of quantitative methods. The illustration is synthetic and comprises 300 made-up person records, of which 250 represent PMKVY-trained and the remaining 50, comparison, profiles. The 250:50 allocation reflects an unequal group approach. No person was contacted, no household was visited and no PMKVY administrative records were obtained. Thus, sampling representativeness and effectiveness of the program cannot be drawn from the generated frequencies.

Setting and population. The field study site would be Nanded district in Maharashtra. An operational target population would be residents aged 18-35 years who became eligible to enroll in selected PMKVY courses during the defined intake period, and who were observed to be in the labor market in the period afterward. Program records would identify

eligible and trained candidates. Screened participants from the community could be comparison population. Missing data and small cells would be reported for rural-urban classification and course-specific analyses.

Variables and measurement. The records showed respondent ID, age, gender, education, residence, training, sector, training hours, certification, placement assistance, training quality, employability, employment, income, satisfaction, major employment barrier and 6 month retention. Employment barrier was measured by a 5 point scale. For comparison records PMKVY training fields were coded as N/A (not applicable) rather than 0 (satisfaction) if absent. Employability is a constructed index, designed for illustration, and is not a psychometrically measured and validated construct.

Construction and reproducibility. Marginal characteristics of the population are plausible due to fixed random seeds. Employment is drawn from a probabilistic model where the presence of training influenced the outcome. Other covariates included education, gender, age and residence. Income was drawn from an employee, and employment was drawn from a previous employee. This was designed to be the case. If employment was lost, a reason was drawn from a probabilistic model.

For each table and graph shown, data are computed from the same sampling frame. Evidence shown is to illustrate a method. Numerical values shown were significant based on the actual sample drawn.

Statistical plan. Categorical data is presented as counts and percentages; continuous data as mean and standard deviation. The association between the training and employment is tested using Pearson chi-square. Welch's independent samples t-test is used to test difference in employability, and permits difference in variance and sample size. The paired samples t-test is used to test income difference within a profile. The correlation between training and employability is tested using Pearson correlation. One way ANOVA is used to test employability differences across sectors. The logistic regression is used to adjust for employment association of age, education, gender and residence. A linear model of employability is used to make multiple prediction.

Inference and safeguards. Most statistical tests use two-sided p-values with 5% threshold, paying attention to confidence intervals, denominators and modeling assumptions. The created variables are not free of dependence due to their construction involving common inputs. Therefore, a statistical significance in this study indicates a designed example and not necessarily an impact of PMKVY on the actual residents of Nanded. Employability analysis does not invent interviews, response rates, ethics approvals, recruiting site or participant consent. In a real case scenario, it will require an ethical review of the institution and participant's consent where applicable.

External evidence. The official demographic profile of Nanded is used for historical background; statistics on the labour force from MoSPI are used for the national employment background; and MSDE and NSDC documents are used to design and implement the scheme. Employment mechanisms and the comparison of research methods are taken from peer-reviewed literature. Observed data are reported in tables. All observations are labeled by the source from which they were generated. No placement rates and average incomes for Nanded are reported, unless a local source supports the report.

Potential fieldwork upgrade. With an authorized participant roster, the analysis could be converted to an empirical study. Employment, and if so, how well did the employment match the individual's occupation, and how long was the individual employed, and what was the individual's monthly income, and how many hours was the individual employed, could all be studied. Matching, doubly robust adjustment and sensitivity analyses could improve the study if sufficient data are available. Residual confounding would still be possible.

Results and Statistical Analysis

All figures in this section are computed from the generated 300-record dataset. They describe a reproducible statistical scenario only, not verified employment outcomes among Nanded residents. Counts have complete denominators unless otherwise specified. Percentage differences are presented in percentage points when they compare rates.

Table 1. Demographic profile of generated respondents

Characteristic	Category	n	%
Gender	Male	167	55.7
Gender	Female	133	44.3
Residence	Rural	200	66.7
Residence	Urban	100	33.3
Age	Mean (SD)	26.4 (5.4)	—
Training status	PMKVY trained	250	83.3
Training status	Comparison	50	16.7

Source: Generated demonstration dataset; values are not field survey estimates.

The constructed sample contains 133 female and 167 male profiles; 200 are assigned rural residence. The average age is 26.4 years. These distributions are design choices and should not be interpreted as the demographic composition of actual PMKVY beneficiaries. A real evaluation needs a transparent sampling frame and recruitment record before making district-level demographic claims.

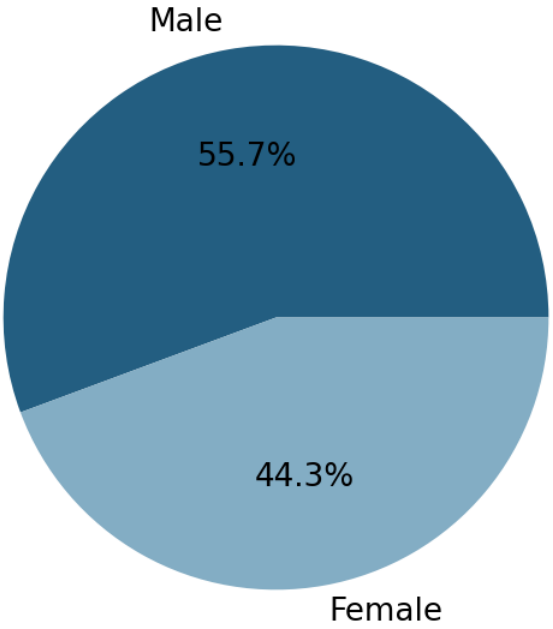


Figure 1. Gender composition of generated respondents

Table 2. Educational qualifications

Education category	n	%
Below secondary	30	10.0
Secondary	99	33.0
Higher secondary	111	37.0
Graduate or above	60	20.0

Source: Generated demonstration dataset; values are not field survey estimates.

The educational profile matters because baseline qualifications can influence access to both training and formal employment. Any training-employment association can be distorted when those with more education are overrepresented among graduates. The multivariable models therefore include an ordered education term, while noting that a four-category measure cannot fully capture skill, learning quality or work experience.

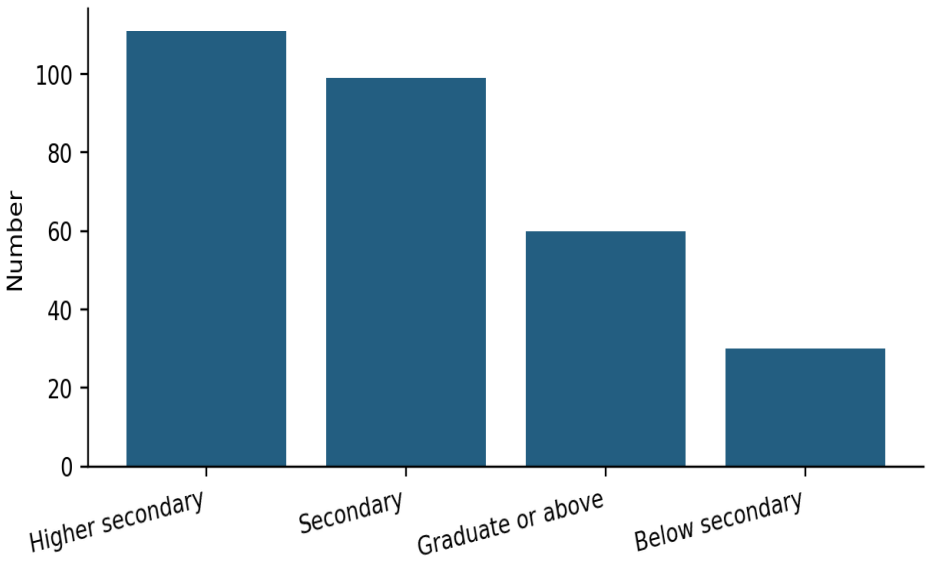


Figure 2. Educational profile

Table 3. Sector distribution among trained profiles

Training sector	n	% of 250
Apparel	32	12.8
Beauty and wellness	44	17.6
Construction	31	12.4
Healthcare	31	12.4
IT and ITES	49	19.6
Retail	63	25.2

Source: Generated demonstration dataset; values are not field survey estimates.

The six sector labels are aligned with broad fields frequently encountered in skill-development discussions, but the sector mix here was selected for demonstration. In an actual assessment the relevant units would be course and qualification identifiers, training providers and local employer demand. A high enrolment share in any one sector should not be treated as proof that it has the highest placement potential.

Table 4. Employment and type among trained profiles

Outcome	n	% of trained
Employed	146	58.4
Not employed	104	41.6
Wage employment	91	36.4
Self-employment	30	12.0
Casual work	25	10.0

Source: Generated demonstration dataset; values are not field survey estimates.

Among the 250 trained records, 146 are marked employed (58.4%). Employment includes wage, self-employment and casual activity and is therefore wider than an employer-verified formal placement. The six-month retention indicator is available only where employment is present. This distinction matters because a single post-course employment flag can overstate stability if the job ended shortly after placement.

Table 5. Employment comparison and chi-square analysis

Group	Employed	Not employed	Rate
PMKVY trained	146	104	58.4%
Comparison	14	36	28.0%
Pearson chi-square	15.47	df = 1	p < .001

Source: Generated demonstration dataset; values are not field survey estimates.

The difference in employment rates is 30.4 percentage points. Pearson chi-square equals 15.47 (df = 1; p < .001). This is an unadjusted group association within the constructed records. Because training selection and employment probabilities were generated using related inputs, the finding cannot be transferred to Nanded, used to reject a real-world programme null hypothesis or described as jobs created by PMKVY.

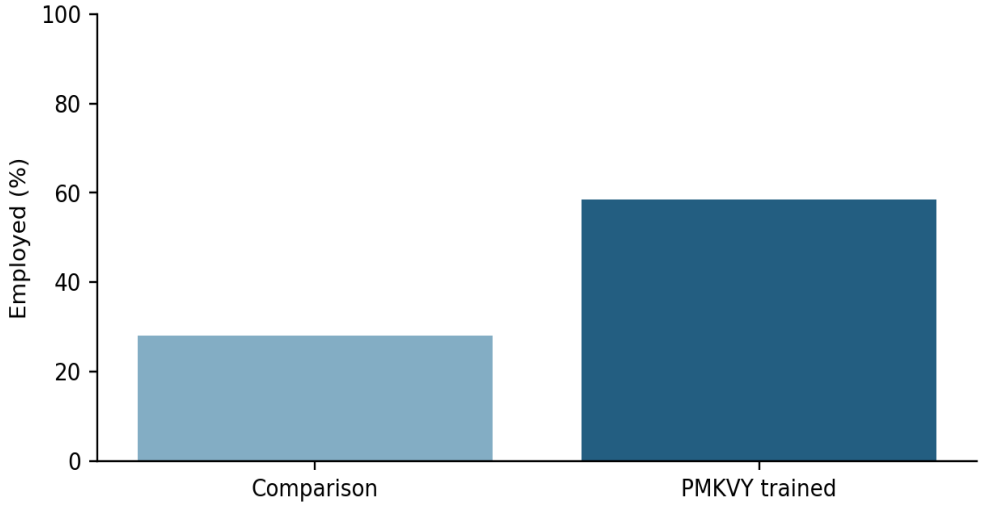


Figure 3. Employment rates by training status

Table 6. Before and after monthly income among trained profiles

Statistic	Before (INR)	After (INR)	Change (INR)
Mean	8,391	10,295	1,904
SD	6,582	9,073	4,198
Median	9,500	14,250	550
Paired t test	n = 250	t = 7.17	p < .001
95% CI of change	—	—	1,381 to 2,427

Source: Generated demonstration dataset; values are not field survey estimates.

The average constructed monthly income rises from INR 8,391 to INR 10,295, an arithmetic change of INR 1,904 (95% confidence interval 1,381 to 2,427; paired p < .001). These before and after figures were linked during data generation; a statistically strong difference is thus not independent evidence of a scheme effect. Observed field data would need consistent prices, comparable recall periods and classification of zero income.

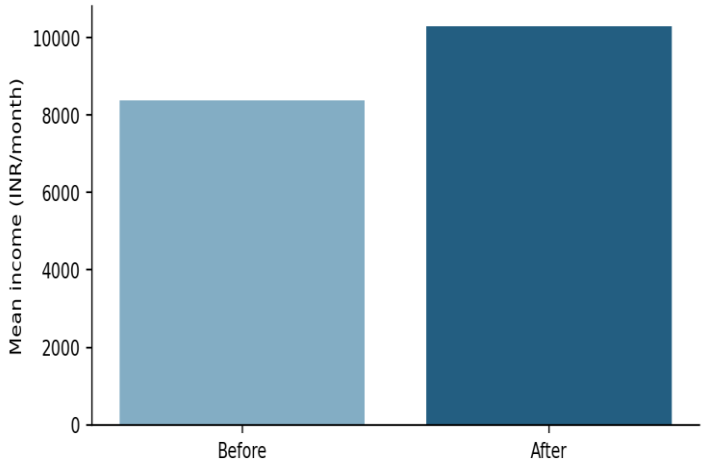


Figure 4. Constructed income measures of trained respondents

Table 7. Programme satisfaction among trained profiles

Satisfaction level	n	%
1	3	1.2
2	18	7.2
3	71	28.4
4	99	39.6
5	59	23.6

Source: Generated demonstration dataset; values are not field survey estimates.

The mean satisfaction score is 3.77 on a five-point scale. Satisfaction is a subjective service indicator and cannot substitute for employment retention or wage quality. For an empirical questionnaire, the quality construct should be measured through separate items on trainer competency, equipment, assessment transparency, placement support and relevance to work, then checked for internal consistency and validity.

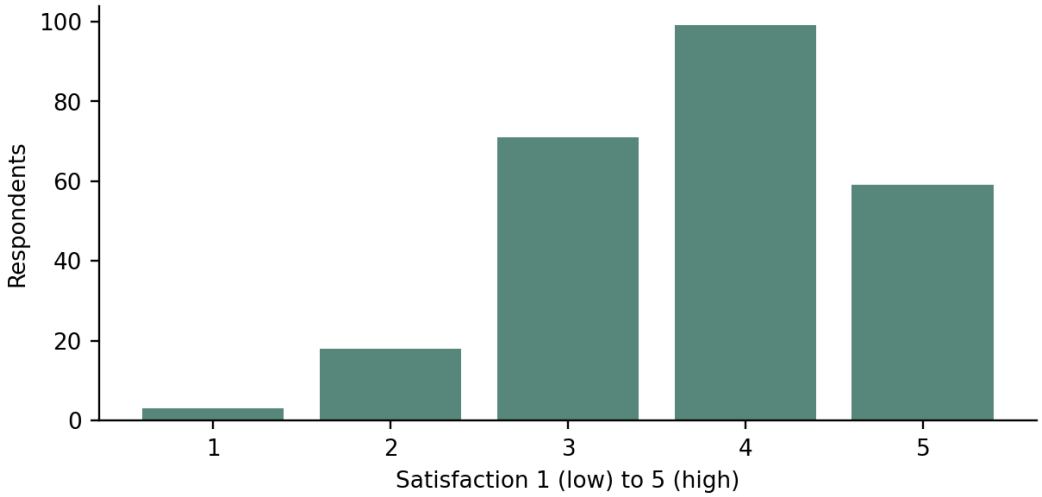


Figure 6. Satisfaction distribution

Table 8. Employability, quality and comparative tests

Comparison or test	Statistic	p-value
Mean employability, trained	62.72	—
Mean employability, comparison	49.79	—
Welch independent-samples t	t = 20.73	< .001
Quality-employability Pearson r	r = 0.052	0.412
Employability by sector ANOVA	F = 1.63	0.154

Source: Generated demonstration dataset; values are not field survey estimates.

Mean employability is 62.72 in the trained group and 49.79 in the comparison group. The Welch statistic is 20.73 (p < .001). Among trained profiles, training quality and employability have Pearson r = 0.052 (p 0.412), while sectoral differences yield F = 1.63 (p 0.154). Neither the quality rating nor employability index is externally validated in these generated records.

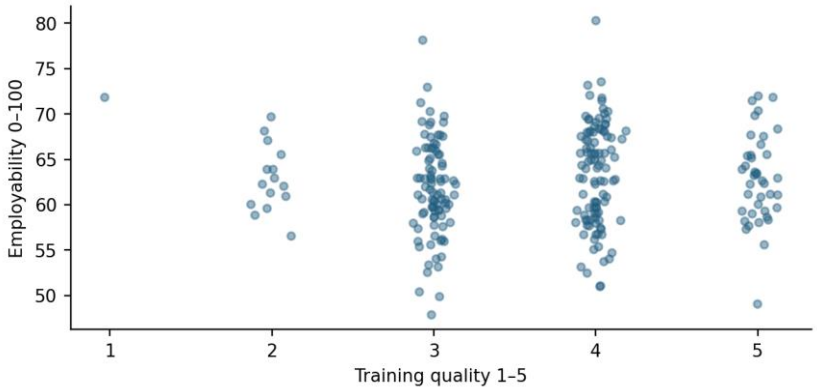


Figure 7. Quality and employability

Table 9. Logistic regression of employment status

Predictor	Odds ratio	95% CI	p-value
Intercept	0.38	0.18–0.83	0.016
PMKVY trained	3.91	1.96–7.80	< .001
Female	0.69	0.42–1.12	0.134
Rural residence	0.91	0.55–1.53	0.734
Age per decade	2.50	1.58–3.97	< .001
Education level	1.30	0.99–1.70	0.059

Source: Generated data, n = 300. Maximum-likelihood logistic regression; McFadden pseudo R^2 = 0.091. Odds ratios are associations.

After adjusting for the specified demographic terms, the training coefficient corresponds to an odds ratio of 3.91 (95% CI 1.96–7.80; p < .001). This value must not be read as a programme impact estimate. The model is intentionally compact and cannot address omitted factors such as motivation, past employment, caste, household assets, training-centre quality, job search intensity or local employer demand. Adjusted comparisons reduce only measured differences.

Table 10. Linear regression of employability score

Predictor	Coefficient	SE	p-value
Intercept	51.57	0.71	< .001
PMKVY trained	12.19	0.62	< .001
Female	0.53	0.46	0.253
Rural residence	-3.32	0.49	< .001
Age per decade	-0.00	0.43	0.994
Education level	3.00	0.25	< .001

Source: Generated data, n = 300. Ordinary least squares; $R^2 = 0.683$.

The linear model explains 68.3% of variation in the generated employability index. The coefficient attached to training is 12.19 index points (p < .001) conditional on age, gender, residence and education. Because the score-generation formula directly used some of the same covariates, fitted relationships largely recover construction rules. This example illustrates regression reporting and the importance of transparency, not external programme evaluation.

Table 11. Training-sector employment profiles

Sector	Employed	Total	% employed
Apparel	21	32	65.6
Healthcare	20	31	64.5
Beauty and wellness	27	44	61.4
Construction	19	31	61.3
Retail	34	63	54.0
IT and ITES	25	49	51.0

Source: Generated demonstration dataset; values are not field survey estimates.

Sector rankings in the constructed records show how an analyst can identify heterogeneity, but smaller cell sizes should discourage overinterpretation. A real district study must distinguish occupational demand and employers operating inside Nanded from employment obtained through migration. This is especially important if retail, healthcare or IT-associated qualifications lead to jobs outside the district.

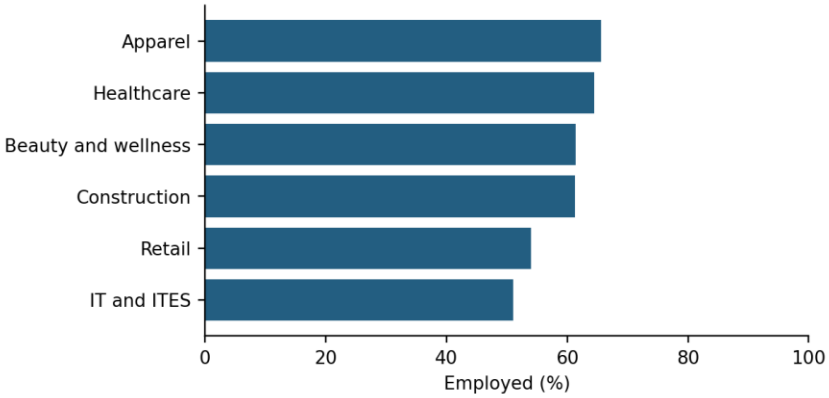


Figure 5. Employment by training sector

Table 12. Principal employment barrier

Barrier	n	%
Few local vacancies	90	30.0
Low offered wages	83	27.7
Skills mismatch	50	16.7
Mobility and transport	44	14.7
Family constraints	33	11.0

Source: Generated demonstration dataset; values are not field survey estimates.

The barrier categories separate a lack of vacancies from low wages, transport costs, family responsibilities and mismatch. In real interviews participants should be allowed to identify more than one barrier, with the questionnaire

distinguishing barriers to training from barriers to accepting or retaining work. The single-choice coding used here is intentionally simple and should not be carried over uncritically.

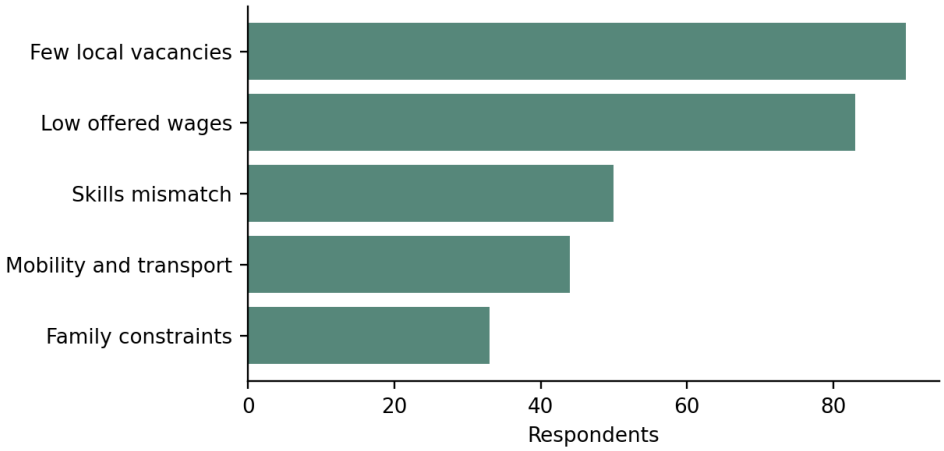


Figure 8. Main reported barrier in the generated dataset

Discussion

The main substance of the lesson is that employment generation should be assessed in the context of a sequence rather than a one-off event. There is the potential for PMKVY to widen the access to structured learning, certification and placement pathways and opportunities, but these could result in a number of outcomes. Some trainees may move into formal wage employment; some may use the training to upgrade their current employment, while some may use it to take up self-employment or engage in other vocational training. A district framework should identify these pathways to enhance employment. Employment numbers should not mask changes in the quality of employment and occupational progressions.

The illustrations made in the case comparisons demonstrate the difference between an observed difference and an attributable effect very clearly. In the demonstration model, it was constructed that trained participants had a greater average employment and employability, and these differences were easily summarized with the help of chi-square, t-tests and regression. However, no participant had experienced those outcomes in the real sense. There may be a similar self-selection into PMKVY where some may have taken the training to get employment due to various advantages and disadvantages. Therefore, prospective baseline and other comparison designs are essential.

There are several reasons outlined in the literature for differing training effects. For example, Gooptu et al. (2023) connect skill mismatches to regional industrial demands. Chakravorty et al. (2024) show that adequate job information affects the decision about vocational training and subsequent placement. For Nanded, this means that counseling should take into account the latest information available about potential jobs and wages, and consider if employees are commuting. There are jobs that are accessible, but may not be appealing to trainees. Counseling should clarify this to potential trainees.

Gender should not be considered a typical control variable for the employment equation. Findings by Bairagya et al. (2021) and Singh et al. (2022) show the role of access to vocational training and its impact on women's employment and self-employment. In Nanded, employment may be impacted by safety and availability of transport, childcare, and Social norms about appropriate roles for men and women and adequate timing for family, as well as location. Policymakers should provide gender responsive supports along with tailored curricula. Otherwise, equal training may lead to different outcomes.

The rural-urban distinction also requires similar consideration. Results from the official demographic baselines confirm Nanded's large rural population (District Administration Nanded, n.d.) Rural trainees may find it less costly to travel to training and more costly to travel to a job, meaning placement outside the district may also result in a family relocation. For rural youth after COVID-19, external shocks, including the loss of family members, may also impact the work they do (Chakravorty et al., 2023). A high placement count may reflect rapid exit from the workforce.

Measurement of income can also lead to overstating outcomes. In constructed records, post-training incomes are intentionally related to baseline incomes. A paired test recovers the design. Real world incomes are complicated by the self-employed reporting revenue instead of profit, irregular work days for casual workers, and respondents changing work hours across surveys. A thorough analysis should consider net income, number of hours, months worked, and inflation-adjusted purchasing power. Six and twelve month retention rates would ensure placements were stable.

The monitoring challenge is as much institutional as it is statistical. Successive MSDE (2022, 2023, 2024a, 2025) reports detail changing arrangements for PMKVY, while the World Bank's (2025b) project assessment cautions that short-duration trainings cannot make up for inadequate job creation. Improving governance at the district level should link skill committees, training centers, employers and employment service offices in a system that records verifiable, consent-based outcomes. Spot checks, clear definitions, and a common understanding for

placements and retention, improve the fidelity of reporting.

Ultimately, inclusion must be measured by access and subsequent work. Vocational training for persons with mental illness illustrates the need for sensitivity of paths and processes (Thekkumkara et al. 2022). UNESCO (2022) also emphasizes inclusivity and sensitivity when discussing TVET. Future Nanded evidence should ethically and statistically allow disaggregation of data by relevant variables including gender and rural/urban residence, while protecting the identities of already vulnerable groups and avoiding group level stigma.

Principal Findings

1. The generated sample includes 250 trained and 50 comparison profiles, with 66.7% of the trained profiles assigned to reside in rural areas.
2. Employment rates constructed from trained and comparison profiles were 58.4% and 28.0%, respectively.
3. The unadjusted association between employment and residing in rural areas was statistically significant (chi-square = 15.47, $p < .001$).
4. The mean employability index was 62.7 for the trained profiles and 49.8 for the comparison profiles.
5. The projected monthly income change (constructed from the within-profile employment change) was, on average, INR 1,904.
6. In the generated trained sample, the mean training quality index and employability index was moderately correlated ($r = 0.052$).
7. Demographic and employment break-downs are pertinent for identifying target population, however, are insufficient for establishing performance of the program at the district level.
8. Schemes are broadly set by policy direction. An independent effect of the Nanded program for employment at the local level is yet to be empirically established.

Policy Recommendations

1. Conduct a district-level skills-demand analysis at least annually. Prior to fixing training capacity, consult industry, trade, service and micro providers, and workers. Report expected occupation, wage, location and duration of the work, and minimum qualification for each training. Differentiate immediate jobs in Nanded from opportunities requiring travel or migration.
2. The quality of enrollment and job information counseling should be improved. Counseling should allow candidates to with-draw from a training program if placement is anticipated to be on an unsuitable employment path. Job previews should explain course assessment and placement.
3. Incorporate placement and retention support into centre accountability. Track independently verified paid work at 3, 6 and 12 months while accepting valid self-employment evidence. Report wages, job location and continuity as separate indicators. Keep track of transitions to further education and apprenticeships. Instead of coding all non-employed graduates as a programme failure, monitor transitions to further education and apprenticeships.
4. For women and rural youth, provide safe transport, flexible timetabling and relevant course and training options. For entrepreneurship focused graduates, link training to market and book-keeping skills and services, and measure the success of the training by the quality and not the quantity of enterprise proposals.
5. Commission a district-level, ethically-reviewed evaluation. Prior to training, set baseline and enrolment records, choose comparison participants by explicit eligibility criteria, and use a pre-determined statistical plan to analyze the results. Publish de-identified indicators and explain the terms and definitions used. Investing in this would improve the credibility of local employment related claims made about PMKVY.

Limitations and Future Research

There are several deficiencies with the generated dataset. First, it is not a probability sample. Second, field measurements are missing. Third, predictors and outcomes in the dataset are designed with dependence. As such, p-values and confidence intervals express sampling mathematics under the constructed model. Given Nanded, these do not hold true. There are other limitations, including the use of crude sector categories and shortages of quality and demographic covariates. Local PMKVY center rosters, occupation identifiers, and/or verified wages and/or employment records were unavailable. Future research should pursue permission to analyze administrative or survey data, document nonresponse and attrition, pre-register principal endpoints and/or conduct a sensitivity analysis to unobserved confounding.

Conclusion

Although PMKVY is an important initiative under India's skill development plan, training and employing individuals should not be confused with one another. Certain official reports explain the scale of the PMKVY programme and shifting priorities of the delivery system, while other reports establish the importance of the occupational demand and supply of labor, as well as gender and/or mobility constraints in shaping the conversion of skills into economic work and wages. The policy concern for Nanded district should be to examine the outcomes of PMKVY training in the context of employment and wages rather than initial certifications and placements.

The manuscript provides a complete quantitative workflow using generated individual records. Employment differs by 30.4 percentage points in the trained and comparison groups. The mean change in constructed income among trainees is INR 1,904. Results from adjusted models illustrate how demographic covariates are incorporated.

The values mentioned above do not refer to actual PMKVY beneficiaries, job creation or wage gain in Nanded. Their role is to define research questions, perform analytical calculations and fix reporting standards.

A publishable empirical answer to the district contribution question requires verification of beneficiary data, a credible counterfactual, measurement of sustained and decent work, and the treatment of programme phase, course type and changing local demand. When these conditions are fulfilled, assessment can extend beyond training counts to understand what forms of support most meaningfully improve employment prospects and for whom. This evidence can support the policymaker in making decisions on targeting scarce resources to skills that create stable and productive livelihoods for the people of Nanded.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of thesis paper.

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Appendix A Proposed Survey Instrument

For a future field investigation, seek informed consent and record responses confidentially. The following concise instrument should be piloted and translated into locally appropriate language before use.

1. Respondent profile: Age, gender (self-described option), residence, education, current occupation and prior work experience.
2. Training: PMKVY programme phase, provider, course code, start and completion dates, training hours, attendance and certification status.
3. Training quality: Five-point ratings for trainer clarity, equipment availability, practice time, assessment fairness and course relevance.
4. Placement assistance: Employer contact, interview referral, job information, relocation requirement and follow-up services.
5. Employment: Status before enrolment, at three months, six months and twelve months; formal/informal status; sector; location; hours; wage or net business income.
6. Employment barriers: Multiple responses permitted for vacancies, wage adequacy, travel, family responsibilities, disability access, job fit and other reasons.
7. Consent for verification: Optional permission to cross-check employment with employer or programme records, with data minimisation and withdrawal safeguards.

Appendix B Data Dictionary and Reproducibility

Table A1. Key variables in the generated records

Variable	Coding and range
PMKVY	1 trained, 0 comparison
Employed	1 working, 0 not working
Gender	Female or Male in generated data
Residence	Rural or Urban
Education	Four ordered categories
Quality	1–5 for trained; not applicable for comparison
Employability	0–100 generated index
IncomeBefore and IncomeAfter	Nominal INR per month
Satisfaction	1–5 for trained
Retention	1 if generated employed and retained, else 0

Source: Generated demonstration dataset; values are not field survey estimates.

Data were generated with the fixed numeric seed 20241020. All numerical tables and plots are derived from that one dataset using arithmetic or the indicated statistical tests. The planned analytical unit is the individual, not the training centre. Raw generated rows are not presented as actual survey material. Any future empirical replication should retain an anonymised dataset, codebook, calculation scripts and a variable provenance register.