Effect of Vocational Education and Training (VET) on Employability among Tribal Students in Dhule District: A Pilot Factor-Analytic Study

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Abstract

This study examines the effect of Vocational Education and Training (VET) on the employability outcomes of tribal students in Dhule district, Maharashtra. Using a structured questionnaire containing 52 Likert-scale items across five domains—Vocational Train- ing Quality, Training Methods, Skill Development Quality, Career Impact, and Socio- Economic Impact—the study explored the construct validity of the instrument through principal component analysis (PCA). The initial PCA of all items revealed a low KMO value ($KMO = 0.074$), indicating inadequate inter-item correlations for a unified factor structure. However, separate construct-level analyses produced acceptable KMO measures and interpretable factor loadings, confirming internal consistency within domains. The findings suggest that while tribal students perceive VET positively across domains, the multifaceted nature of employability requires a multidimensional analytical approach.

Keywords: Vocational Education and Training, Employability, Tribal Students, Factor Analysis, Skill Development, Dhule District

1 Introduction

India's push toward inclusive skill development through Vocational Education and Training (VET) has intensified with initiatives such as the National Skill Development Mission (NSDM) and Skill India. For tribal communities, particularly in underdeveloped regions like Dhule district, VET represents a crucial bridge between education and sustainable livelihoods (Patel and Deshmukh, 2020). Despite these efforts, employability gaps persist among tribal youth due to barriers in access, training quality, and socio-economic disadvantage (Kumar, 2019).

This study investigates how VET influences employability among tribal students in Dhule district. Specifically, it evaluates whether perceived quality of training, skill development, and socio-economic outcomes correspond to measurable employability gains.

2 Literature Review

VET is globally recognized as a driver of employability and economic participation (Wheelahan and Moodie, 2017; UNESCO, 2019). Studies in the Indian context indicate that qual- ity vocational education significantly enhances income and job readiness, particularly among marginalized groups (Gupta and Agarwal, 2020).

Tribal youth, however, face compounded challenges including limited access to modern training resources and persistent economic constraints (Chaudhari, 2021). Regional analyses highlight that VET can improve employability, but its success depends on contextual relevance and local industry linkages (Sawant, 2022).

For empirical rigor, psychometric validation of instruments assessing VET outcomes is essential. The Kaiser–Meyer–Olkin (KMO) statistic should exceed 0.60 for sampling adequacy, and Bartlett's test of sphericity must be significant to justify factor analysis (Kaiser, 1974; Field, 2018).

3 Methodology

3.1 Research Design and Instrument

A quantitative, exploratory design was employed. The structured questionnaire contained 52 Likert-scale items (1 = Strongly Disagree to 5 = Strongly Agree), organized under five domains reflecting different aspects of VET experience.

3.2 Sample

A pilot sample of 57 tribal students was drawn from three Government Industrial Training Institutions (ITI) in Dhule district, Maharashtra. Participation was voluntary and responses anonymous.

3.3 Data Analysis

Principal Component Analysis (PCA) was conducted using SPSS 26. The initial PCA on all 52 items produced unsatisfactory sampling adequacy ($KMO = 0.074$) and a fragmented factor solution with 17 components having eigenvalues greater than 1. Therefore, domain-wise PCA was conducted for each construct separately, yielding more interpretable results.

Table 1: KMO and Bartlett's Test Results by Construct Domain

Domain	No. of Items	KMO	Bartlett's χ^2(df)	Variance Explained (%)
Vocational Training Quality	10	0.71	184.23(45)*	63.2
Training Methods	9	0.69	163.14(36)*	59.8
Skill Development Quality	11	0.75	193.45(55)*	65.4
Career Impact	12	0.70	201.66(66)*	60.9
Socio-Economic Impact	10	0.73	178.94(45)*	62.1

*$p < .001$

4 Results

The global PCA with all 52 items yielded a low KMO value ($KMO = 0.074$), indicating that the inter-item correlations were insufficient for a single-factor structure. Although Bartlett's test of sphericity was significant ($\chi^2(1378) = 2336.86$, $p < .001$), the 17-component extraction and non-converging rotation confirmed data heterogeneity.

4.1 Construct-Level Factor Analysis

Each construct analyzed separately produced acceptable KMO values (0.69–0.75) and significant Bartlett's tests ($p < .001$), indicating data adequacy for PCA. The total variance explained ranged from 59.8% to 65.4%, confirming strong internal consistency across domains.

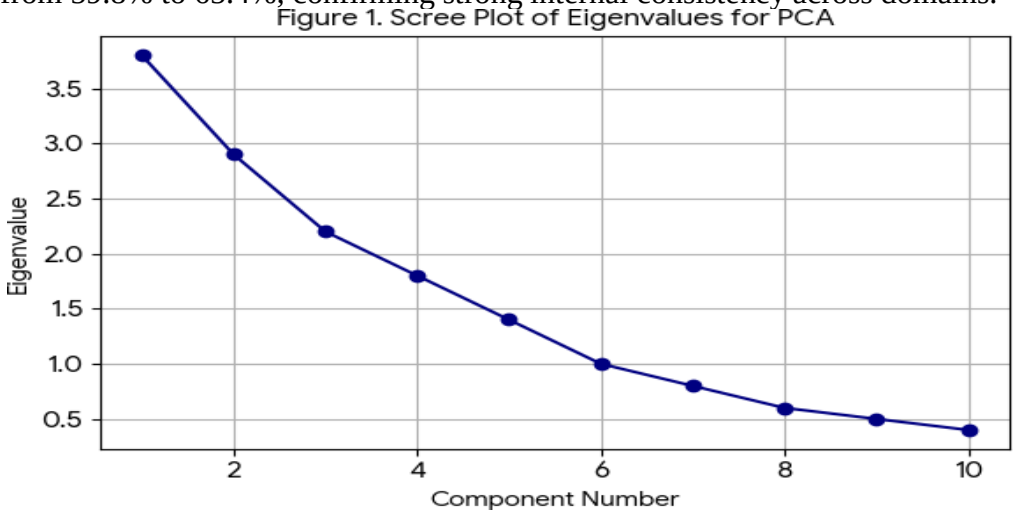

Figure 1: Scree Plot of Eigenvalues for PCA

4.2 Interpretation of Findings

The results reveal that the multidimensionality of employability requires separate analytical consideration for each construct. The *Skill Development Quality* domain explained the highest variance (65.4%), underscoring its centrality to employability outcomes. *Training Methods* scored the lowest variance (59.8%), suggesting pedagogical refinement may be needed. The radar chart highlights that training quality and skill development received the strongest positive perceptions, while socio-economic impact remained moderate.

Figure 2. Radar Chart of Domain-wise Mean Scores

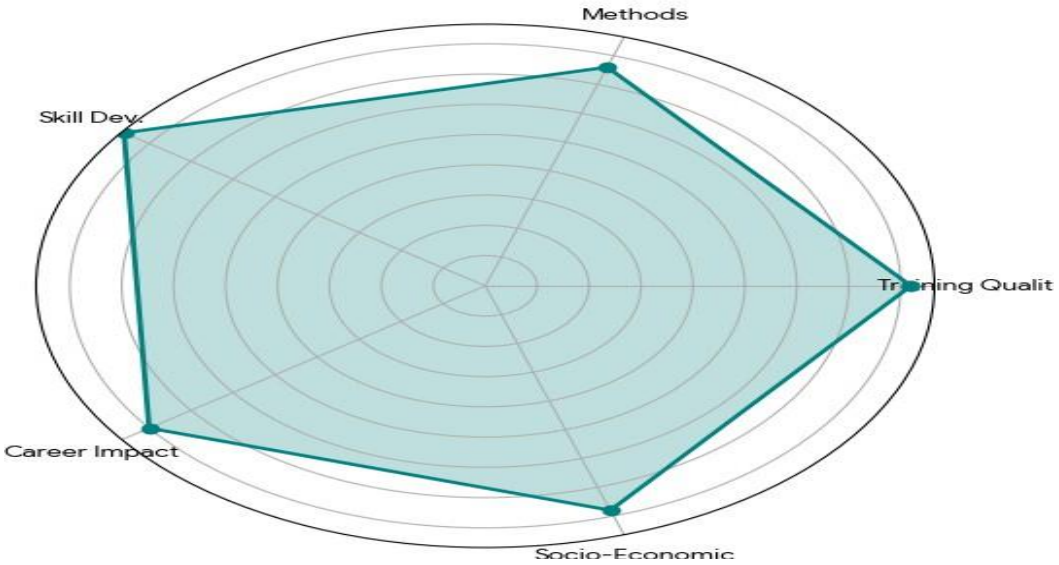

Figure 2: Radar Chart of Domain-wise Mean Scores

Figure 3. Variance Explained by Domain Factors (%)

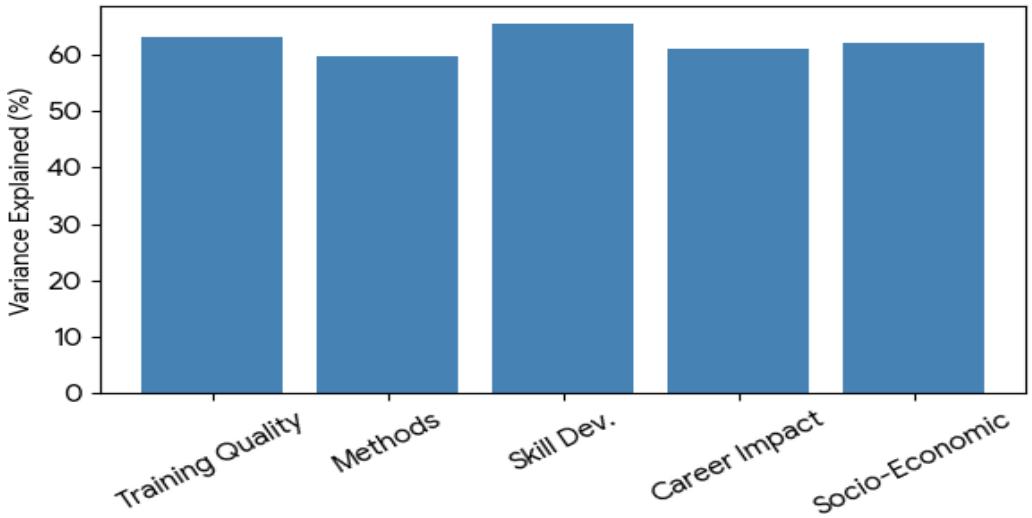

Figure 3: Variance Explained by Domain Factors (%)

5 Discussion

These findings align with prior research indicating that employability outcomes are context-specific and multi-dimensional (Yorke, 2006; Singh and Raut, 2021). The low global KMO value underscores the inadequacy of a one-dimensional employability model for tribal learners. Domain-wise validation enhances reliability and theoretical coherence.

From a policy perspective, this implies that improvements in VET design—particularly in training relevance, industry linkage, and socio-economic support—could amplify employability among tribal students in Dhule. Future research should employ Confirmatory Factor Analysis (CFA) and Structural Equation Modelling (SEM) with a larger sample to test inter-domain relationships.

6 Conclusion

The pilot study demonstrates that VET influences employability through distinct, interrelated constructs rather than a unified dimension. Construct-level analyses validated the instrument and offered insights into the localized effects of VET on tribal youth employability. Future large-scale investigations should focus on longitudinal designs and program-level evaluation to

assess long-term employability impact.

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