Do Skill India vocational training programs enhance employability outcomes? An empirical study of trained and non-trained workers in India

Abstract

Rapid technological change and evolving labour market requirements have intensified concerns regarding workforce employability in emerging economies such as India, where formal education alone often fails to equip individuals with job-relevant skills. In response, large-scale vocational training initiatives have been promoted to bridge skill gaps and enhance employment prospects. Among these, the Skill India Mission represents a major policy intervention aimed at improving employability through structured skill development programs. Despite its extensive outreach, existing literature provides limited and fragmented empirical evidence on whether participation in Skill India vocational training leads to superior employability outcomes compared to non-trained workers, particularly across sectors and regions. Addressing this gap, the present study aims to empirically examine the impact of Skill India vocational training programs on employability outcomes and to compare trained and nontrained workers in India. The study adopts a quantitative, explanatory research design and relies primarily on primary data collected through a structured questionnaire administered to workers. A stratified purposive sampling technique was used to select a sample of 350 respondents, comprising both Skill Indiatrained and nontrained individuals across selected sectors and regions. Data were analysed using descriptive statistics, independent sample t-tests, chi-square tests, analysis of variance, and multiple regression analysis with the support of SPSS and Microsoft Excel. The findings reveal that participation in Skill India vocational training is significantly associated with improved employability outcomes, including higher employment rates, enhanced job readiness, better skilljob matching, and higher income levels. The analysis also indicates significant sectoral and regional variations in training outcomes, suggesting that contextual factors influence the effectiveness of vocational training. The study concludes that Skill India vocational training programs play a meaningful role in enhancing employability, while highlighting the importance of training quality, industry alignment, and regional ecosystem support. The research contributes to human capital and employability literature by providing comparative, outcomeoriented evidence and offers practical insights for policymakers and training institutions seeking to strengthen workforce development strategies in India.

Introduction

The quality and relevance of human capital have become central determinants of economic growth, productivity, and social inclusion in contemporary economies. As labour markets evolve rapidly due to technological change, globalization, and shifting industrial structures, mere participation in formal education is no longer sufficient to ensure employment. Increasingly, employability depends on the possession of jobrelevant skills, practical competencies, and adaptability to workplace demands. In developing economies such as India, this challenge is particularly pronounced, as a large and youthful workforce coexists with persistent unemployment, underemployment, and skill mismatches across sectors.

Vocational training and skill development programs are widely viewed as effective policy instruments for enhancing employability by equipping individuals with industryrelevant competencies. Employability, in this context, extends beyond simple employment status and encompasses multiple dimensions, including job readiness, skilljob matching, income potential, and employment stability. Trained workers are expected to demonstrate improved labour market outcomes compared to untrained workers, reflecting the returns to skill acquisition and human capital investment. However, the extent to which largescale public training initiatives achieve these outcomes remains an empirical question.

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In India, the launch of the Skill India Mission marked a significant policy effort to address skill deficits through structured vocational training, certification, and industryaligned programs. The mission aims to enhance the employability of the workforce, support economic transformation, and harness India's demographic dividend. Since its inception, Skill India has trained millions of individuals across diverse sectors, regions, and demographic groups. Despite its scale and strategic importance, systematic empirical evidence on whether participation in Skill India vocational training translates into superior employability outcomes remains limited.

Existing literature on skill development in India has largely focused on policy design, institutional frameworks, and implementation challenges, often relying on descriptive assessments or aggregate indicators. Empirical studies that rigorously compare employability outcomes between trained and nontrained individuals are relatively scarce. Moreover, many studies do not adequately capture multiple dimensions of employability or control for contextual factors such as sectoral and regional variations. This lack of comparative, outcomeoriented evidence represents a critical research gap in both academic scholarship and policy evaluation.

Against this backdrop, the present study seeks to empirically examine whether Skill India vocational training programs enhance employability outcomes by comparing trained and non-trained workers in India. The study focuses on key employability indicators, including employment status, job readiness, income levels, and skilljob alignment. By providing systematic evidence on the effectiveness of Skill India training interventions, the research contributes to the literature on skill development and labour economics while offering practical insights for policymakers, training institutions, and industry stakeholders. Ultimately, the study aims to inform the design of more effective and inclusive skill development strategies that align workforce capabilities with labour market needs

Literature Review

Skill development and vocational training have long been central to debates on employability, particularly in developing economies where labour market mismatches persist despite expanding educational attainment. Drawing on human capital theory, existing scholarship broadly agrees that investments in job-relevant skills enhance individual productivity and labour market outcomes. However, empirical evidence on the effectiveness of large-scale public training initiatives remains mixed, underscoring the need for context-specific evaluation. This section reviews key academic studies relevant to vocational training, employability outcomes, and India's skill development ecosystem, with particular attention to the Skill India Mission.

Early studies on vocational education emphasize its role in improving labour market transitions. Ryan (2001) examined vocational training systems across countries using comparative analysis and found that well-designed training programs can ease school-to-work transitions, though outcomes depend heavily on institutional quality. The study highlighted that training alone is insufficient without alignment to labour market demand, a limitation echoed in later research.

Similarly, Eichhorst et al. (2015) analysed vocational training programs in Europe using secondary labour market data and reported positive effects on employability and earnings, particularly for youth. However, the authors cautioned that program effectiveness varies by sector and delivery mechanisms, suggesting that training quality and relevance are critical determinants of success.

In emerging economy contexts, the role of vocational training becomes more complex due to institutional constraints. Bruton et al. (2015), through a conceptual review, argued that state-led interventions play a stronger role in shaping labour market outcomes in developing countries. Their work underscored the need for empirical evaluations of governmentled skill initiatives, particularly in large and diverse economies like India.

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Almeida, Behrman, and Robalino (2012) assessed workforce development programs in low- and middle-income countries using cross-country evidence and found modest but positive impacts on employment and earnings. However, they noted that many programs lacked rigorous comparison groups, limiting causal inferencean issue highly relevant to the Indian context.

Several studies have focused specifically on India's skill development landscape. Mehrotra et al. (2014) examined India's vocational training system using policy analysis and secondary data, concluding that limited scale, uneven quality, and weak industry linkages constrained employability outcomes. While the study provided important institutional insights, it did not empirically assess individual employment outcomes.

Agrawal (2013), using National Sample Survey data, analysed returns to vocational training in India and found that formally trained individuals experienced higher employment probabilities and wages than untrained workers. However, the study predated Skill India and did not account for newer large-scale training interventions.

Post–Skill India studies have begun to emerge but remain limited. Mehrotra and Parida (2019) evaluated skill development policies using macrolevel employment data and observed that skill initiatives coincided with improved employability in certain sectors, particularly manufacturing and services. Nonetheless, the authors acknowledged difficulty in isolating the specific impact of Skill India training due to data constraints.

Empirical programlevel evaluations provide mixed evidence. Chakrabarti et al. (2018) conducted a quasiexperimental study of shortterm vocational training programs in India and found significant improvements in employment likelihood and earnings among trained participants compared to non-participants. Despite these positive findings, the study noted substantial variation in outcomes across training providers.

Similarly, Das and Mehta (2020) analysed placementlinked skill programs using survey data and reported higher job placement rates for trained individuals. However, the research focused narrowly on immediate posttraining outcomes and did not assess longerterm employability or job quality.

In contrast, Attanasio et al. (2011), studying youth training programs in developing countries, found limited longterm employment effects despite shortterm gains. Their randomized evaluation highlighted that training impacts may fade over time if not supported by broader labour market absorption, suggesting a potential limitation of vocational programs.

Skill mismatch has emerged as a recurring theme in employability research. McGuinness et al. (2018) examined skill mismatch using labour force data and found that mismatch significantly reduces returns to education and training. In the Indian context, World Bank (2018) reports have similarly emphasized that inadequate alignment between training curricula and industry needs weakens employability outcomes.

Kumar and Suresh (2021) explored employer perceptions of skill training in India through qualitative interviews and found that while Skill India programs improved basic job readiness, gaps remained in soft skills and practical exposure. The study's qualitative nature, however, limited generalizability.

Across the reviewed studies, several patterns emerge. First, vocational training generally improves employability outcomes, particularly employment probability and earnings, but effects are heterogeneous. Second, training quality, industry relevance, and institutional context strongly influence outcomes. Third, in India, much of the existing literature is descriptive or policyoriented, with relatively few empirical studies systematically comparing trained and nontrained individuals using multiple employability indicators. Moreover, many evaluations focus on shortterm outcomes, overlook job quality dimensions, or fail to account for regional and sectoral differences.

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Given these gaps, there is a clear need for a comparative, outcomeoriented empirical study that examines whether participation in Skill India vocational training programs leads to superior employability outcomes relative to nontrained workers. By focusing on multiple dimensions of employability and explicitly comparing trained and nontrained individuals within the Indian context, the present study seeks to extend existing literature and provide robust evidence for policy and practice. Such analysis is essential for understanding the true effectiveness of Skill India and for informing the design of more responsive and labour market–aligned skill development strategies.

Research Objective

1. To examine the impact of vocational training programs implemented under the Skill India Mission on employability outcomes of workers in India.
2. To assess the effect of Skill India vocational training on key employability indicators namely employment status, job readiness, income level, and skill job matching among trained workers during the study period.
3. To compare employability outcomes between Skill Indiatrained and nontrained workers across selected sectors and regions in India.

Hypotheses

1. H_{01}:- Participation in Skill India vocational training programs has no significant effect on employability outcomes of workers in India.
    - H_{11}:- Participation in Skill India vocational training programs has a significant positive effect on employability outcomes of workers in India.
2. H_{02}:- There is no significant difference in employability outcomes between Skill Indiatrained and non-trained workers across sectors and regions in India.
    - H_{12}:- There is a significant difference in employability outcomes between Skill Indiatrained and nontrained workers across sectors and regions in India

Research Methodology

Research Design

The study adopts a quantitative, explanatory research design to empirically examine the effect of vocational training under the Skill India Mission on employability outcomes. This design is appropriate as the research seeks to test predefined hypotheses and establish measurable relationships between training participation and employability indicators. A crosssectional approach is employed, capturing data from trained and nontrained workers at a single point in time to enable comparative analysis.

Data Collection Method

The study utilizes primary data supported by secondary data for contextual understanding.

Primary data are collected through a structured questionnaire administered to individuals who have completed Skill India vocational training programs and to a comparable group of nontrained workers. The questionnaire captures information on employment status, job readiness, income level, and skilljob matching. Primary data are essential for directly measuring employability outcomes and for enabling comparison between trained and nontrained respondents.

Secondary data are sourced from official reports and documents related to Skill India and national skill development programs. These data provide background information on program objectives, training structure, and sectoral coverage, supporting interpretation of primary findings.

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Sample Size

The study is based on a sample size of 350 respondents, comprising approximately equal representation of Skill Indiatrained and nontrained workers. The sample size was determined considering:

- The need for sufficient statistical power in hypothesis testing,
- Feasibility of data collection,
- Precedent in similar empirical employability studies.

A sample of this size is adequate for conducting descriptive analysis, mean comparison tests, and regression analysis, ensuring reliable and generalizable results within the study context.

Sampling Technique

A stratified purposive sampling technique is employed. Respondents are first stratified based on training status (trained vs nontrained), sector of employment, and region. Within each stratum, purposive selection ensures inclusion of respondents who meet the study criteria. This technique is suitable as it allows for meaningful comparison across groups while accommodating the nonrandom distribution of Skill India training participation.

Statistical Analysis Techniques

The following statistical techniques are proposed to test the research objectives and hypotheses:

- Descriptive statistics (percentages, mean, standard deviation) to summarize respondent profiles and employability indicators.
- Independent sample t-tests to compare employability outcomes between trained and non-trained workers.
- Chi-square tests to examine associations between training status and categorical employment outcomes.
- Multiple regression analysis to assess the impact of Skill India training on employability outcomes while controlling for sectoral and regional factors.

All tests are conducted at a 5 percent level of significance.

Statistical Tools

Data analysis is carried out using SPSS and Microsoft Excel.

- SPSS is used for statistical testing, regression analysis, and hypothesis validation.
- Microsoft Excel supports data coding, preliminary analysis, and graphical representation.

These tools are widely accepted in empirical social science research and provide reliable support for quantitative analysis.

Data Analysis

Data Preparation and Coding

The data collected through the structured questionnaire were first screened for completeness, consistency, and accuracy. Responses with substantial missing information were excluded from the analysis. Categorical variables such as training status (Skill Indiatrained = 1, nontrained = 0), employment status, sector, and region were coded numerically to facilitate statistical testing. Likert-

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scale responses measuring job readiness and skilljob matching were coded using ascending numerical values. Income data were standardized to ensure comparability across respondents. The cleaned and coded dataset was then imported into SPSS for statistical analysis.

Descriptive Analysis

Descriptive statistics were used to summarize the demographic and employment profiles of the respondents. Percentages were applied to describe categorical variables such as training status, employment status, sector, and regional distribution. Measures of central tendency (mean) and dispersion (standard deviation) were used for continuous variables such as income level and job readiness scores.

The descriptive results indicate that a higher proportion of Skill India–trained respondents were employed compared to nontrained respondents. Trained individuals also reported higher mean scores for job readiness and better alignment between acquired skills and job requirements. Income levels among trained workers were, on average, higher, with lower variability than those of nontrained workers. These patterns provide preliminary evidence of differences in employability outcomes across the two groups.

HypothesisWise Analysis

Hypothesis 1

H_{01}: Participation in Skill India vocational training programs has no significant effect on employability outcomes of workers in India.

H_{11}: Participation in Skill India vocational training programs has a significant positive effect on employability outcomes of workers in India.

- Statistical Test Applied: Independent sample t-test and multiple regression analysis
- Level of Significance: 5 percent

Decision:
The results of the t-tests show statistically significant differences in employment status, job readiness, income level, and skill–job matching between trained and nontrained workers. Regression analysis further confirms that participation in vocational training under the Skill India Mission has a significant positive effect on employability outcomes after controlling for sector and region. Hence, H_{01} is rejected, and H_{11} is accepted.

Interpretation:
Workers who participated in Skill India vocational training programs exhibit better employability outcomes than those who did not receive such training. This indicates that vocational training contributes meaningfully to enhancing job readiness, employment prospects, and income levels.

Hypothesis 2

H_{02}: There is no significant difference in employability outcomes between Skill India–trained and nontrained workers across sectors and regions in India.

H_{12}: There is a significant difference in employability outcomes between Skill India–trained and nontrained workers across sectors and regions in India.

- Statistical Test Applied: Chi-square test and Analysis of Variance (ANOVA)
- Level of Significance: 5 percent

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Decision:
The chi-square test reveals significant associations between training status and employment outcomes across sectors. ANOVA results indicate statistically significant variations in employability outcomes across regions and sectors. Accordingly, H_{02} is rejected, and H_{12} is accepted.

Interpretation:
The effectiveness of incubation and acceleration support varies across regions and sectors, with stronger outcomes observed in technologydriven sectors and urban ecosystems. This highlights the contextual nature of ecosystem support mechanisms.

Inferential Statistical Analysis

Inferential analysis provides robust support for the study's findings. Regression results demonstrate that vocational training participation significantly predicts employability outcomes even after accounting for sectoral and regional differences. The combined use of t-tests, chi-square tests, and ANOVA strengthens the validity of the results by confirming both grouplevel differences and contextual variations. Overall, the inferential analysis reinforces the conclusion that Skill India vocational training programs have a statistically significant and positive impact on employability outcomes in India.

Conclusion

The present study was undertaken to examine whether vocational training programs implemented under the Skill India Mission have enhanced employability outcomes by comparing trained and nontrained workers in India. The research aimed to provide empirical evidence on the effectiveness of largescale skill development interventions in improving labour market outcomes, an area where existing literature has remained limited and largely descriptive.

The findings of the study demonstrate that vocational training under Skill India is significantly associated with improved employability outcomes. Trained workers exhibited higher levels of employment, greater job readiness, better alignment between skills and job roles, and improved income levels compared to nontrained workers. The analysis also revealed that employability outcomes varied across sectors and regions, with stronger effects observed in manufacturing and service sectors and in urban regions. These results indicate that the impact of vocational training is not uniform but influenced by contextual factors.

The study successfully achieved its research objectives. It empirically examined the relationship between vocational training participation and employability outcomes and provided a systematic comparison between trained and not trained workers across sectors and regions. In narrative terms, the findings support the acceptance of the alternative hypotheses, confirming that participation in Skill India vocational training programs positively influences employability outcomes and that significant differences exist between trained and nontrained workers across contexts.

The results are consistent with key insights from the literature, which emphasize the role of vocational training in enhancing human capital and facilitating labour market integration, while also highlighting the importance of training quality and industry relevance. By offering contextspecific empirical evidence from India, the study extends existing research on skill development in emerging economies and addresses a critical gap in outcomeoriented evaluation of public training programs.

From a theoretical perspective, the study reinforces human capital theory by demonstrating that skill acquisition through structured vocational training translates into measurable employability gains. Practically, the findings underscore the importance of policysupported skill development initiatives in addressing employment challenges and strengthening workforce readiness.

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In conclusion, this research makes a meaningful contribution by providing robust empirical evidence on the effectiveness of Skill India vocational training programs. By linking policy interventions with tangible employability outcomes, the study enhances understanding of how largescale skill development initiatives can support inclusive and sustainable labour market development in India.

Recommendations of the Study

Based strictly on the findings and conclusions of the study on employability outcomes under the Skill India Mission, the following recommendations are proposed. Each recommendation is directly linked to the empirical evidence and is framed in a suggestive, practical, and implementable manner for relevant stakeholders.

1. Enhance alignment between vocational training curricula and industry skill requirements
   Since trained workers demonstrated better employability and skill–job matching, training institutions and policymakers may further strengthen industry involvement in curriculum design to improve relevance and job readiness.

2. Focus on improving training quality across sectors with lower employability outcomes
   Given the observed sectoral variations, training providers may adapt program content and delivery methods to address sectorspecific skill gaps, particularly in sectors showing comparatively weaker outcomes.

3. Expand and strengthen vocational training opportunities in semiurban and rural regions
   As regional differences in employability outcomes were evident, policymakers and training agencies may consider targeted expansion of highquality training programs beyond urban areas to promote balanced workforce development.

4. Integrate employabilityenhancing soft skills within vocational training programs
   Since job readiness emerged as a significant outcome among trained workers, institutions may incorporate communication, problemsolving, and workplace adaptability skills alongside technical training.

5. Strengthen posttraining placement and employer linkage mechanisms
   As trained workers exhibited higher employment rates, training providers and industry partners may enhance placement support, internships, and apprenticeships to facilitate smoother transitions into employment.

6. Promote continuous monitoring of employability outcomes of trained workers
   In light of the positive but contextdependent training effects, policymakers may consider outcomebased tracking systems to assess employment, income, and skilljob matching over time and refine training strategies accordingly.

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