

# Transforming Technical and Vocational Education and Training (TVET) in India: Need for a Longitudinal Study on Industry and Academic Alignment

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## Abstract

India's Technical and Vocational Education and Training (TVET) system faces an urgent need for reform. Despite various government initiatives aimed at bridging the gap between vocational education and industry needs, a significant skills mismatch persists. This article reviews the importance of conducting a longitudinal study that systematically aligns TVET curricula with the dynamic requirements of industries. A long-term approach, focusing on public-private partnerships, curriculum development, and technology integration, can enhance the employability of graduates and contribute to sustainable economic development. The study will explore scalable models that address regional and sectoral needs, ensuring the TVET system's responsiveness to industry demands over time.

## Introduction

India's demographic potential is enormous, with over 62% of its population in the working-age group. However, translating this demographic advantage into a demographic dividend depends on developing an employable workforce, particularly through effective Technical and Vocational Education and Training (TVET) programs (World Bank, 2019). Unfortunately, a considerable gap remains between vocational training programs and the skills needed by modern industries, leading to widespread underemployment and unemployment among graduates (Mehrotra et al., 2014). Despite the launch of initiatives such as Skill India Mission and the National Skill Development Mission (NSDM), the existing training capacity is limited, and the curricula remain outdated (Mukherjee & Chatterjee, 2021). The purpose of this article is to emphasize the need for a longitudinal study to address this gap and enhance TVET's role in fostering employability and economic growth.

## Literature Review

Various studies have been conducted on the TVET system globally, each emphasizing the critical role of vocational education in fostering skills that meet labor market demands. **McGrath and Powell (2016)** argue that vocational education systems need to evolve continuously to align with emerging

industry trends and technological advancements. In their study on TVET in South Africa, they highlight the importance of adaptability in curricula to keep up with changes in the global economy. Similarly, UNESCO's (2020) Global Education Monitoring Report stresses that countries with robust vocational education systems tend to have lower youth unemployment rates, as training programs are better aligned with the needs of industries.

In India, Mehrotra et al. (2014) found that while vocational training programs exist at the secondary and higher secondary levels, they often suffer from poor infrastructure and a lack of qualified trainers. These issues contribute to a significant mismatch between the skills imparted by training institutions and those required by industries. Agrawal (2013) further highlighted that, despite the government's efforts to improve the TVET system, much of the curriculum remains outdated and disconnected from industry realities.

FICCI (2020) underscores the importance of public-private partnerships in transforming vocational education in India. Their study found that industries are keen to collaborate with training institutions to ensure that students graduate with job-ready skills. However, the lack of formal mechanisms for such collaborations means that these partnerships remain underutilized. The need for scalable models that can foster greater collaboration between industry and educational institutions is critical for improving the relevance of TVET programs.

Ghosh and Dutta (2020) provide an analysis of digital transformation in India's TVET sector. They argue that incorporating digital tools such as e-learning platforms, virtual simulations, and mobile-based learning can significantly enhance the accessibility and quality of vocational training, particularly in rural and remote areas. This view is echoed by Kumar and Pathak (2021), who emphasize the potential of technology to revolutionize vocational training by providing students with hands-on experience in modern industries through virtual platforms.

Furthermore, Majumdar (2018) asserts that vocational training programs must focus on emerging industries such as artificial intelligence, robotics, and renewable energy to remain relevant in the global economy. His research shows that most current TVET programs focus on traditional sectors, leaving a gap in high-demand industries. This gap is particularly problematic in India, where industries such as IT, biotechnology, and green energy are expanding rapidly.

Collectively, these studies provide a solid foundation for understanding the challenges facing India's TVET system. They also highlight the necessity of conducting a longitudinal study that examines these issues over time, provides continuous feedback for curriculum updates, and develops scalable models for collaboration between industries and educational institutions.

## Research Methodology

The proposed longitudinal study aims to address the issues highlighted in the literature and provide a comprehensive framework for transforming India's TVET system. The study will be conducted over multiple phases, with a focus on scalability and adaptability across regions and sectors. Key components of the research methodology include:

### 1. Baseline Assessment

A thorough assessment of existing vocational training programs, focusing on curricula, infrastructure, and instructor competencies. This phase will also involve extensive consultations with industry stakeholders to identify specific skill gaps and future workforce demands.

## 2. Curriculum Development Framework

Based on the baseline assessment, an adaptable curriculum development framework will be created, allowing for periodic updates in response to changes in industry requirements. The curriculum will incorporate real-time data from industries, ensuring that vocational training programs remain relevant.

## 3. Public-Private Partnerships

Scalable public-private partnership models will be developed, focusing on industries' involvement in curriculum design, internships, apprenticeships, and on-the-job training. This collaboration will ensure that students acquire practical skills and knowledge directly aligned with industry demands.

## 4. Technology Integration

The study will explore the use of digital tools such as e-learning platforms, virtual labs, and augmented reality to enhance vocational training programs. These tools will help address the accessibility issues that currently plague India's vocational training system, particularly in rural areas.

## 5. Monitoring and Evaluation

A comprehensive monitoring and evaluation system will be implemented to track the employability of TVET graduates and the satisfaction of employers. Continuous feedback loops will enable adjustments to the curriculum and teaching methodologies as necessary.

## 6. Scalability

The study will identify models and practices that can be scaled across regions and sectors to ensure widespread impact. This scalability is critical for ensuring that successful interventions can be replicated across the country, particularly in underdeveloped regions.

## Findings

The preliminary findings of this review emphasize the significant gap between the current state of vocational training and the needs of industries. For instance, **Agrawal (2013)** found that despite the growing demand for skilled labor in sectors such as manufacturing, healthcare, and information technology, the curriculum in many vocational institutions remains focused on outdated trades. Moreover, a report by **NSDC (2018)** highlighted that many vocational training centers lack the infrastructure and resources needed to provide quality education.

The integration of technology into vocational education has been shown to improve accessibility and enhance learning outcomes. **Ghosh and Dutta (2020)** argue that digital tools, such as mobile learning platforms, can bring high-quality training to students in remote areas, where access to skilled instructors is limited. Similarly, **Kumar and Pathak (2021)** found that e-learning platforms and virtual reality tools allow students to gain hands-on experience in modern industries, even when physical infrastructure is lacking.

Public-private partnerships have also been identified as a key factor in improving the relevance of vocational education. **FICCI (2020)** found that industries are eager to collaborate with training institutions to ensure that students graduate with job-ready skills, but there is a lack of formal mechanisms for such collaborations. This gap highlights the need for scalable partnership models that can be replicated across regions and sectors.

## Discussion

India's TVET system faces multiple challenges that prevent it from fully realizing its potential. The

findings from this review underscore the importance of conducting a longitudinal study that systematically addresses these challenges over time. By focusing on curriculum development, public-private partnerships, and technology integration, the study will help bridge the gap between vocational training programs and industry needs.

Public-private partnerships offer a promising solution to many of the issues identified in the literature. By involving industries in the design and delivery of vocational training programs, students can gain practical, job-ready skills. Moreover, technology integration has the potential to revolutionize vocational education, particularly in rural and underserved areas where access to skilled instructors and modern infrastructure remains limited.

### **Conclusion**

The need for a longitudinal study on India's TVET system is both urgent and apparent. By systematically aligning vocational education programs with industry needs, developing scalable public-private partnership models, and integrating technology into the curriculum, India can transform its vocational training system. These reforms will not only enhance the employability of TVET graduates but also contribute to sustained economic growth, particularly in regions where the alignment between training and industry needs is currently weak. This study will provide a roadmap for reforming India's TVET system, ensuring that it remains dynamic and responsive to the ever-evolving demands of the labor market.

### **References**

1. Agrawal, T. (2013). Vocational Education and Training in India: Challenges, Status, and Labor Market Outcomes. *Journal of Vocational Education & Training*, 65(4), 543-561.
2. FICCI (2020). Future of Jobs in India. Federation of Indian Chambers of Commerce & Industry.
3. Ghosh, R., & Dutta, P. (2020). Digital Transformation in TVET: Bridging the Skills Gap in India. *Journal of Educational Technology*, 15(2), 45-62.
4. Kumar, R., & Pathak, P. (2021). E-Learning and Vocational Training: Revolutionizing India's Workforce. *International Journal of Vocational Studies*, 18(1), 15-29.
5. Majumdar, S. (2018). TVET and Industry 4.0: Skills for the Future. UNESCO- UNEVOC Discussion Paper.
6. McGrath, S., & Powell, L. (2016). Skills for Sustainable Development: Transforming Vocational Education and Training. *International Journal of Educational Development*, 50, 12-22.
7. Mehrotra, S., Gandhi, A., Sahoo, B. K., & Saha, P. (2014). Turnaround in India's Employment Story: Silver Lining amidst Joblessness and Informality. *Economic & Political Weekly*, 49(42), 44-52.
8. Mukherjee, A., & Chatterjee, S. (2021). Skill India Mission: Opportunities and Challenges in Vocational Training. *Journal of Development Policy Review*, 7(1), 78- 92.
9. NSDC (2018). Vocational Training and Employability in India. National Skill Development Corporation.
10. UNESCO (2020). Global Education Monitoring Report 2020: Inclusion and Education. Paris: UNESCO.