

Industrial Training Institutes (ITIs) of India: From Establishment to Modernization—A Comprehensive Review of 75 Years (1950–2025)

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Abstract

Industrial Training Institutes (ITIs) constitute the oldest, largest, and most geographically widespread component of India's formal long-term vocational training architecture. Introduced in 1950 under the Craftsmen Training Scheme (CTS) with a modest network of approximately 50 institutes, the system has expanded dramatically to between 13,856 and 15,034 ITIs by 2026 (Government: roughly 3,300–3,345; Private: roughly 11,300–11,736). Seating capacity increased from 17.43 lakh in the 2014–15 academic session to approximately 20.08 lakh in 2026, while enrolment rose from 9.51 lakh to 14.70 lakh.

Despite this numerical growth, ITIs have remained predominantly associated with traditional mechanical and electrical trades such as Fitter and Electrician, reinforcing a narrow public image. However, macro-level disruptions in the contemporary labor market induced by generative artificial intelligence (AI) are shifting enterprise priorities toward applied technical competencies over conventional, theory-centric academic degrees. This dynamic repositions modernized vocational education alongside secondary school as a highly aspirational, future-proof career strategy reminiscent of historical engineering streams. Over seven and a half decades, successive governments have launched multiple interventions, including the Craftsmen Training Scheme, the Apprentices Act of 1961, the Vocational Training Improvement Project (VTIP), the Public-Private Partnership (PPP) model, the Skill Strengthening for Industrial Value Enhancement (STRIVE) project with an outlay of ₹2,200 crore, the Dual System of Training, and the flagship Pradhan Mantri Skilling and Employability Transformation through Upgraded ITIs (PM-SETU) scheme with a total outlay of ₹60,000 crore aimed at upgrading 1,000 Government ITIs. The private sector now accounts for 75–78 per cent of all institutes.

Evidence from the STRIVE National Tracer Study (2024) indicates that 85.3 per cent of surveyed pass-outs were economically active, of whom approximately 49 per cent were engaged in wage employment, self-employment, or apprenticeship. Nevertheless, when benchmarked against Germany's dual vocational training system, Indian ITIs continue to exhibit significant shortcomings in industry ownership, paid practical training, curriculum co-design, instructor quality, and social prestige.

This research paper provides a detailed secondary-data analysis of the historical evolution, statistical expansion, public perception, policy interventions, private-sector role, structural deficiencies, and pathways for transformation. It concludes with actionable recommendations for infrastructural modernisation, image repositioning, and alignment with the aspirations of a developed India by 2047.

Introduction

Following Independence in 1947, India adopted a strategy of planned industrialisation articulated through successive Five-Year Plans. The rapid expansion of manufacturing, infrastructure, and public-sector enterprises created an urgent demand for a steady supply of semi-skilled and skilled craftsmen. In response, the Government of India launched the Craftsmen

Training Scheme (CTS) in 1950 and established approximately 50 Industrial Training Institutes across the country (Directorate General of Training [DGT], n.d.; Ministry of Skill Development and Entrepreneurship [MSDE], 2024).

The foundational objectives of the scheme were fourfold: to ensure a continuous flow of skilled workers for domestic industry; to enhance both the quantity and quality of industrial production through systematic, standardised training; to mitigate unemployment among educated youth by equipping them with employable skills; and to foster a technical and industrial outlook among the younger generation. These objectives reflected the developmental priorities of a newly independent nation seeking self-reliance in industrial manpower.

In their formative decades, ITIs were closely aligned with the technological paradigm of Industry 3.0 and therefore concentrated heavily on mechanical and electrical engineering trades—Fitter, Turner, Machinist, Welder, Electrician, and related occupations. This historical concentration has had lasting consequences for institutional identity and public perception. Even today, ITIs are popularly identified with these traditional trades, while their role in preparing craftsmen for emerging sectors such as information technology, renewable energy, electric mobility, healthcare support services, and advanced manufacturing remains under-recognised (Economic and Political Weekly [EPW], 2026).

As India aspires to become a developed nation by 2047 (Viksit Bharat), the quality, relevance, and social standing of its vocational training system have acquired strategic importance. This paper undertakes a comprehensive examination of the ITI ecosystem over 75 years, analysing establishment and objectives, quantitative expansion, trade composition, evolving public image, major policy schemes, private-sector contribution, comparative deficiencies vis-à-vis the German dual system, and concrete strategies for modernisation and image transformation.

Literature Review

Official documentation from the Directorate General of Training and the Ministry of Skill Development and Entrepreneurship establishes that the CTS commenced in 1950. Administrative control of day-to-day operations was transferred to State Governments and Union Territory administrations in 1956, while financial control followed in April 1969. The Central Government continues to discharge responsibilities related to training standards, curriculum development, examination, and certification (DGT, n.d.; MSDE, 2024).

A detailed institutional analysis published in the Economic and Political Weekly (2026) demonstrates that the number of ITIs more than tripled after the mid-2000s. This expansion was driven overwhelmingly by private and rurally located institutes. The study documents a concurrent decline in average institutional quality, a growing spatial mismatch between the location of ITIs and centres of manufacturing activity, and an enrolment pattern that disproportionately channels historically disadvantaged social groups into a training pathway positioned low in the educational hierarchy (EPW, 2026).

The most comprehensive recent evidence on employment outcomes is provided by the STRIVE National Tracer Study (2024), which surveyed 11,136 ITI pass-outs. Of these, 85.3 per cent were found to be economically active—i.e., part of the labour force. Within this group, 31.6 per cent were in wage employment, 7.9 per cent in self-employment, and 9.5 per cent in apprenticeship, yielding an overall economic engagement rate of approximately 49 per cent. Comparison with the earlier 2018 tracer study reveals relative stability in outcomes (DGT, 2024).

International comparative literature consistently identifies Germany's dual vocational education and training system as a global benchmark. Key features include substantial industry financing of training (often 70–80 per cent of costs), legally structured training contracts, monthly stipends for apprentices, curricula jointly developed by employers, trade unions, and public authorities, and high social recognition of vocational qualifications. Placement rates frequently exceed 85–90 per cent (Bertelsmann Stiftung, 2017; Euler, 2013; World Economic Forum [WEF], 2015). Indian analyses repeatedly highlight the absence of comparable industry ownership, the persistence of a theory–practice gap, instructor shortages, and residual social stigma attached to vocational pathways (Halder et al., 2026; NITI Aayog, 2023).

Collectively, the literature portrays an ecosystem that has achieved impressive scale yet continues to face structural challenges of quality, relevance, and prestige.

Methodology

This research paper employs a descriptive-analytical design based exclusively on secondary data. The principal sources comprise:

- Official publications, scheme guidelines, and statistical reports of the Directorate General of Training (DGT) and the Ministry of Skill Development and Entrepreneurship (MSDE);
- Press Information Bureau (PIB) releases and parliamentary replies spanning 2014–2026;
- Aggregated data from the National Council for Vocational Training Management Information System (NCVT MIS);
- The STRIVE National Tracer Study report (2024);
- Peer-reviewed and policy-oriented academic literature, including articles in the Economic and Political Weekly and comparative studies published by the Bertelsmann Stiftung and the World Economic Forum;
- Supporting documents from the World Bank on the Vocational Training Improvement Project (VTIP) and STRIVE.

The temporal coverage extends from the inception of the CTS in 1950 to the most recent available figures for 2026. Quantitative data on institute numbers, seating capacity, enrolment, and scheme outlays are presented descriptively. Comparative analysis is used to benchmark Indian ITIs against the German dual system. Limitations include minor discrepancies in aggregate ITI counts across official sources (ranging from 13,856 to 15,034) and the relative scarcity of rigorous, long-term impact evaluations for certain schemes. No primary field survey was undertaken.

Results

(i) Establishment and Foundational Objectives

The Craftsmen Training Scheme was formally introduced in 1950 with the establishment of approximately 50 ITIs. The scheme's objectives were explicitly developmental: to generate a reliable pipeline of skilled craftsmen for an industrialising economy; to improve both the volume and quality of industrial output through structured training; to address educated unemployment by imparting marketable skills; and to instil a technical and industrial culture among youth (DGT, n.d.).

Administrative decentralisation occurred in 1956 and financial decentralisation in 1969. Under the constitutional framework, vocational training is a concurrent subject. The Central Government, through the DGT, retains policy, standard-setting, examination, and certification functions, while State Governments and Union Territory administrations manage day-to-day operations and infrastructure.

(ii) Quantitative Expansion and Trade Composition

The growth trajectory of the ITI network may be summarised as follows:

Period/ Year	Number of ITIs	Seating Capacity	Enrolment	Notes
1950	~50	—	—	Inception under CTS
1980	830	—	—	Early expansion
1987	1,900	—	—	Gulf-driven private growth
2014	9,642	17,42,986	9,51,168	Pre-Skill India baseline
2024–25	14,615–15,034	~26,00,000 (approx.)	12,00,000–14,70,000	Government: ~3,300; Private: ~11,500

2026	13,856	20,07,580	14,70,277	Latest consolidated PIB data
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(Sources: Amar Ujala, 2025; DGT, n.d.; MSDE, 2026a, 2026b)

Private institutes now constitute 75–78 per cent of the total network. Uttar Pradesh hosts the largest number (3,275 ITIs and approximately 3.86 lakh enrolment), followed by Bihar, Maharashtra, Rajasthan, and Karnataka.

Training is currently offered in 169 National Skills Qualifications Framework (NSQF)-compliant trades of one- or two-year duration. Of these, 31–32 have been classified as new-age or future-skills courses covering artificial intelligence, internet of things, electric vehicles, drones, cybersecurity, green hydrogen, semiconductors, and related domains (MSDE, 2026a). Despite this diversification, traditional trades—particularly Electrician, Fitter, and Welder—continue to dominate enrolment preference across most states. Seat utilisation remains modest at approximately 50–55 per cent, prompting the cancellation of affiliation for thousands of chronically under-utilised units in recent years (Amar Ujala, 2025).

(iii) Evolution of Public Image

The enduring public image of ITIs is shaped by their historical concentration on mechanical and electrical trades. In popular perception, ITI education is frequently regarded as a “second-best” or “blue-collar” option, positioned below general academic and polytechnic pathways. Factors reinforcing this image include outdated physical infrastructure in many older institutes, variable placement outcomes, limited vertical mobility to higher education, and the socio-economic profile of the typical trainee cohort (EPW, 2026). Although successive policy documents have sought to reposition vocational training as aspirational, attitudinal change has been gradual.

Furthermore, macro-level disruptions induced by the rapid deployment of generative artificial intelligence (AI) are driving a fundamental structural reorganization of the global labor market. Recent data from World Economic Forum (WEF) projections indicate that approximately 39 per cent of core occupational skills will undergo radical transformation or obsolescence by 2030, driven by an 88 per cent adoption rate of AI systems across enterprise functions (WEF, 2025). Crucially, empirical evaluations by the International Monetary Fund (IMF) demonstrate that the automated displacement of cognitive, routine desk-based operations has caused entry-level corporate hiring in highly exposed fields to contract significantly (IMF, 2026). In response, upwards of 70 per cent of contemporary employers report prioritizing robust, domain-specific vocational capabilities over traditional, theory-centric university credentials (WEF & PwC, 2026). This systemic labor shift mirrors the historical institutional prestige once strictly reserved for formal engineering streams. By structurally integrating specialized vocational competencies directly alongside secondary education, prospective entrants circumvent the diminishing returns of a generic academic degree. Consequently, the contemporary economic landscape elevates the modernized ITI pathway from a legacy, blue-collar choice into a highly coveted, future-proof strategic mechanism for human-capital development in the digital age.

(iv) Major Policy Interventions over 75 Years

The policy landscape has evolved through several distinct phases:

- **1950:** Launch of the Craftsmen Training Scheme.
- **Late 1940s–1960s:** Establishment of the Craft Instructor Training Scheme and early Central Training Institutes.
- **1961:** Enactment of the Apprentices Act, subsequently amended to broaden coverage.
- **1977:** Introduction of the Advanced Vocational Training Scheme for serving industrial workers.
- **Mid-2000s:** Vocational Training Improvement Project (VTIP) covering 500 ITIs with World Bank support.
- **Approximately 2007:** Formalisation of the Public-Private Partnership model, under which industry partners chair Institute Management Committees and receive interest-free loans of up to ₹2.5 crore per ITI.
- **2017–2024:** Implementation of STRIVE (₹2,200 crore), which supported 424 ITIs and 33 industry clusters, trained 27,615 instructors, and raised female enrolment from a baseline of 9.7 per cent to 21.89 per cent (DGT, 2024; MSDE, 2024).
- **Ongoing:** Dual System of Training, linking classroom instruction with structured industry exposure.

- **2025 onwards:** Launch of PM-SETU with a five-year outlay of ₹60,000 crore (Central share ₹30,000 crore, States ₹20,000 crore, Industry ₹10,000 crore), targeting the upgradation of 1,000 Government ITIs under a Hub-and-Spoke model (200 Hubs and 800 Spokes) and the transformation of five National Skill Training Institutes into Centres of Excellence (MSDE, 2026c; The Hindu, 2026).

(v) Role of the Private Sector

Private ITIs expanded rapidly during the 1980s, particularly in southern India, in response to overseas demand for skilled craftsmen in the Gulf region. Today they form the numerical majority of the system. The PPP framework institutionalised industry participation through Institute Management Committees. Under PM-SETU, industry contribution of approximately 17 per cent has been made mandatory and the use of Corporate Social Responsibility funds is explicitly permitted. While private participation has been indispensable for scale, quality heterogeneity remains a persistent concern (Bertelsmann Stiftung, 2017; MSDE, 2026c).

Discussion and Conclusion

(i) Structural Shortcomings Relative to the German Dual System

Germany's dual system is characterised by legally binding training contracts, substantial employer financing, paid apprenticeships, jointly designed curricula, and high social esteem. Indian ITIs, by contrast, exhibit a pronounced theory–practice gap, limited and often non-mandatory industry exposure, significant instructor vacancies (exceeding 75 per cent in some districts), variable quality among private providers, modest seat utilisation, and residual social stigma (DGT, 2024; EPW, 2026; WEF, 2015). These structural features have prevented the system from attaining the labour-market efficiency and societal recognition observed in Germany.

(ii) Pathways beyond the Traditional Mechanical–Electrical Image

Repositioning requires accelerated rollout of new-age trades, systematic integration of service-sector and digital skills, mandatory and high-quality apprenticeships, industry co-design of curricula, and sustained communication of successful employment outcomes.

(iii) Imperative of Infrastructural and Governance Reform

Seventy-five-year-old physical and pedagogical infrastructure cannot adequately serve contemporary industrial requirements. Priority interventions include modern equipment, smart classrooms, simulation and immersive-technology laboratories, continuous instructor professional development, the Hub-and-Spoke organisational model under PM-SETU, and industry-led Special Purpose Vehicle governance arrangements with clearly defined investment ceilings (up to ₹81 crore for Hub ITIs and ₹40 crore for Spoke ITIs) (MSDE, 2026c).

(iv) Strategies for Constructing a New Institutional Image

A multi-pronged approach is required: deeper and more accountable industry partnerships; introduction of stipend-supported training; systematic publication of placement and tracer-study data; national awareness campaigns to elevate the social status of skilled trades; creation of transparent vertical pathways from ITI certificates to diploma and degree programmes; and rigorous quality assurance mechanisms coupled with regular independent tracer studies.

Conclusion

Over three-quarters of a century, India's Industrial Training Institutes have expanded from a small pilot network of 50 institutes into a vast national system serving more than a million trainees annually. This quantitative achievement is considerable. Yet quality, industry relevance, employment outcomes, and social prestige have not kept pace with scale.

Recent initiatives, particularly STRIVE and the ambitious PM-SETU programme, provide a credible platform for transformation.

Crucially, as the expanding footprint of artificial intelligence continues to automate traditional cognitive and routine desk-based operations, the economic premium on irreplaceable, hands-on working skills has transformed the institutional value proposition of ITIs. If India is to realise the vision of a developed nation by 2047, the ITI system must evolve from a residual pathway into a high-quality, industry-owned, and socially valued route to skilled employment that attracts young learners at the school level over generic degree options. Realising this transformation will demand sustained political commitment, substantial and well-targeted investment, genuine industry leadership, and a decisive shift in public perception. Only then can ITIs fulfil their original promise of supplying the skilled craftsmen essential for national industrial and economic progress.

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