

Impact Assessment for two schemes for Skill Development in ESDM Sector viz. Financial Assistance to Select States /UTs for Skill Development in ESDM Scheme (1) & Skill Development in ESDM for Digital India

Executive Summary

1. Introduction

India's ambition to emerge as a global leader in electronics manufacturing was conceived in 2012 with the introduction of its National Policy on Electronics (NPE). NPE identified Electronics System Design and Manufacturing (ESDM) as a key driver of economic growth, technological self-sufficiency, and employment generation. However, the country's vision was not just to manufacture electronics systems but also to simultaneously build the entire electronic ecosystem. Therefore, an imperative emerged to augment human-resource capacities in this niche sector.

Forward-looking and ahead of its time, the Government of India (GoI), through the Ministry of Electronics and IT (MeitY), proactively introduced two ESDM skill development schemes in 2013-14. These initiatives have significantly contributed to the livelihoods and employability of trainees, especially those from rural and tribal regions, by equipping them with industry-relevant skills that enable sustainable employment opportunities.

The first scheme has been titled "Scheme for Financial Assistance to select States/UTs for Skill Development in Electronics System Design and Manufacturing (ESDM) sector," also known as 'Scheme-1' that was introduced in November, 2013 and the second scheme has been titled as "Skill Development in ESDM for Digital India", also known as 'Scheme-2' that was launched in December-2014. Both schemes aim to train young people, particularly those from marginalised backgrounds, in industry-relevant skills such as semiconductor design, embedded systems, electronic manufacturing services, and AI-driven applications, enabling them to meet the sector's evolving demands.

In subsequent years, these ESDM schemes also contributed a lot to support the following initiatives of Government of India including 'Make in India' (2014), 'Digital India' (2015), as well as the newer version of 'National Policy on Electronics' (NPE, 2019) and even the 'India Semiconductor Mission' (2021). Due to the high relevance of these schemes to

national priorities, it was necessary to conduct an impact assessment of the ESDM scheme to evaluate its effectiveness, with special reference to its contribution to employment generation and its alignment with emerging industry needs.

2. About Impact Assessment Project

This impact assessment project, henceforth referred to as ‘the project’, was entrusted to the Indian Institute of Public Administration (IIPA).

2.1. Goal and Objectives of the Project

The primary goal of the project was to assess the impact of ESDM skill development schemes on beneficiaries, training centres, and industries across India, examining their effects and effectiveness in driving employability and inclusive growth, while also focusing on the alignment of schemes with national priorities.

Based on this broader mandate, the project was undertaken by IIPA with the following objectives:

1. To conduct a comprehensive analysis of the ESDM Scheme to assess its performance and alignment with national objectives set by MeitY.
2. To evaluate the extent to which the ESDM schemes align with MeitY's envisioned impact and assess the realization of scheme objectives, ensuring that intended results and outcomes are achieved.
3. To utilize appropriate data collection tools to conduct field research and gather insights from diverse stakeholder groups, like the key implementation agency at the national and state levels.
4. To evaluate the extent these schemes complement the other schemes at the national level and state levels like Skill India Mission.
5. To identify gaps and challenges in the availability and accessibility of the schemes under the ESDM sector.
6. To document lessons learned and highlight best practices for the future growth and development of similar schemes in the ESDM sector.
7. To evaluate the schemes' contribution qualitatively and quantitatively against their intended outcomes, assessing their overall impact and benefits, especially taking into consideration the certification and placement models (Place and train model and Train and place model).

8. To evaluate the existing feedback and grievance redressal mechanism for beneficiaries.
9. To provide recommendations for implementing the next version of the scheme, considering insights gained from the analysis and stakeholder feedback.

2.2. Research Strategy

This section presents the research strategy and evaluation methodology employed to assess the ESDM schemes, anchored in the REES framework—Relevance, Effectiveness, Efficiency, and Sustainability (Figure E1).

Conceptual Framework

The REES framework served as a comprehensive and a structured tool to assess whether both the schemes of ESDM were aligned well with stakeholder needs (Relevance); was ESDM as a project able to achieves its intended outcomes (Effectiveness); makes optimal use of its resources (Efficiency), and that does this ESDM incubated a potential to maintain benefits over time (Sustainability). The REES Framework outlines the dimensions of Relevance, Effectiveness, Efficiency, and Sustainability used for evaluating the mission (Figure E1).

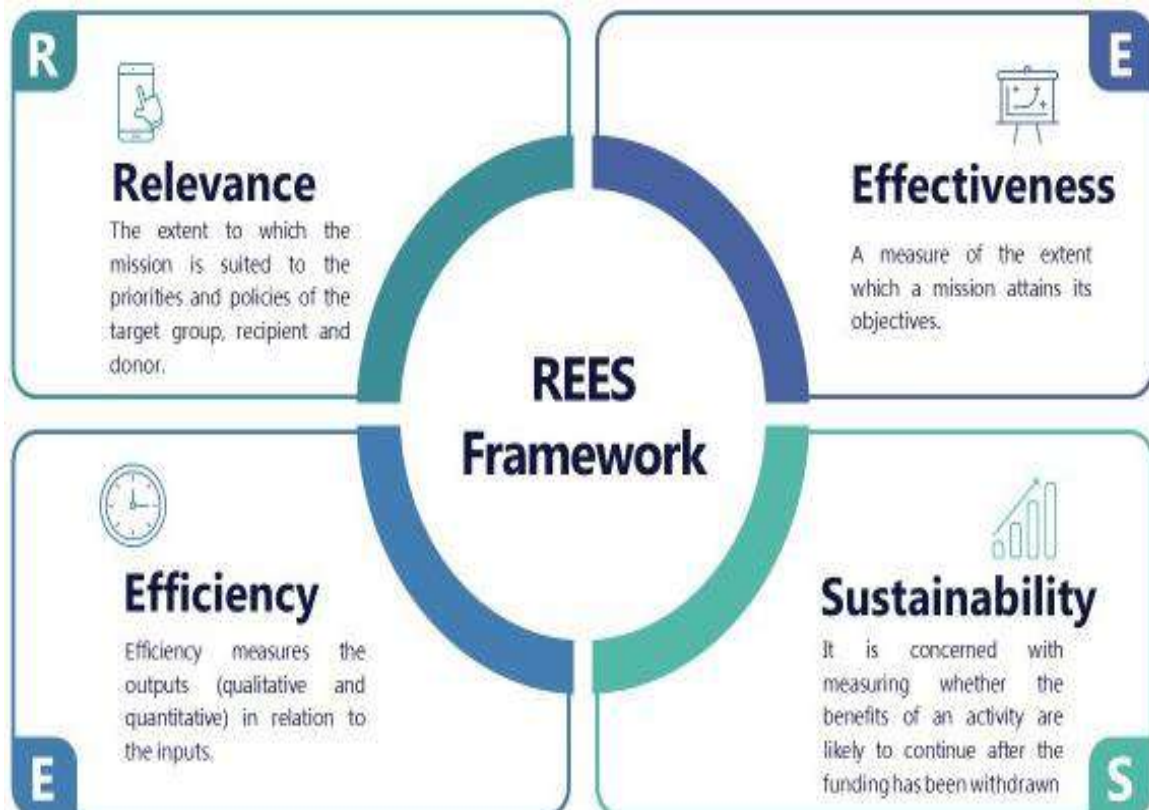


Figure E1: REES Framework

To successfully implement the REES framework, the research strategy (Table E1) adopted by IIPA to achieve its project goals and objectives (Section 2.1) had emphasised triangulation and the integration of primary data with secondary sources to enhance validity and contextual depth. This approach enabled a nuanced understanding of the schemes' strengths, implementation challenges, and offers actionable recommendations for policy refinement and scheme optimisation.

Table E1: Overview of Research Strategy Adopted in the Project

Item	Details
Conceptual Framework	To evaluate both the schemes on their Relevance, Effectiveness, Efficiency, and sustainability (REES Framework) using both Secondary Review and Primary Survey (using Google Forms, Field Visits, Interviews, etc.)
Approach	Mixed-methods design (Quantitative by using Google Forms + Qualitative by field observations, FGD, multi-stakeholder discussions, state-wise comparisons) Quantitative Data - The methodology employed is descriptive statistics, to measure training outcomes and participant demographics. Qualitative Data - The methodology employed is thematic analysis, which aims to identify recurring themes, challenges, and best practices. Mixed Methods - The methodology is triangulation, which serves to validate results across different data sources.
Scope	For Google Forms: Nationwide (18 States/UTs), capturing diversity across geographic, socioeconomic, and institutional dimensions For Field Visits: Minimum 2-3 States
Deliverables	Report delineating strengths of the ESDM Schemes, its implementation challenges and actionable recommendations for policy strengthening and scheme optimization

Data Sources

A mixed-methods design was adopted for multidimensional analysis. At the outset, several secondary sources (Table E2) were reviewed to understand the background and the context of the overall project, with special reference to both the schemes – Scheme 1 and Scheme 2.

The project draws on a diverse range of secondary sources, including government policy documents, industry market reports, international best practices, and academic literature, to provide context, benchmark data, and comparative insights for analysis and recommendations.

Table E2 : Overview of Secondary Sources Employed in the Project

Source	Details
Government Reports	MeitY, NPE 2019, Skill India Mission documents
Industry Reports	Frost & Sullivan (2022), global market trends
Other Best Practices	Taiwan, Japan, US best practices
Literature Reviews	Studies on skill development, electronics manufacturing, and workforce dynamics

No evaluation can be accurate about its cause if it does not glean data from its primary sources. Therefore, in this project, too, quantitative data were collected from nationwide surveys conducted across 18 States/UTs (via Google Forms), and qualitative insights were derived from field visits, in-depth interviews, and focus group discussions.

A. Details of Google Form Survey

The sample covered a diverse respondent base, including beneficiaries from varied gender and socioeconomic profiles, training centres offering specialised courses across rural and urban areas, and industry partners representing small, medium, and large firms in electronics manufacturing, ensuring comprehensive representation (Table E3).

Table E3 : Overview of Sample Size on Which Google Forms Were Employed

Segment	Details	Sample Size
Beneficiaries	Mixed gender & socioeconomic profiles	1,073
Training centres	VLSI, Embedded Systems, Chip Design across rural & urban areas	29
Industry Partners	Small, Medium, Large firms in electronics manufacturing	21

The geographic distribution (Figure E2) of primary survey respondents (collected via Google Forms) across States and Union Territories.

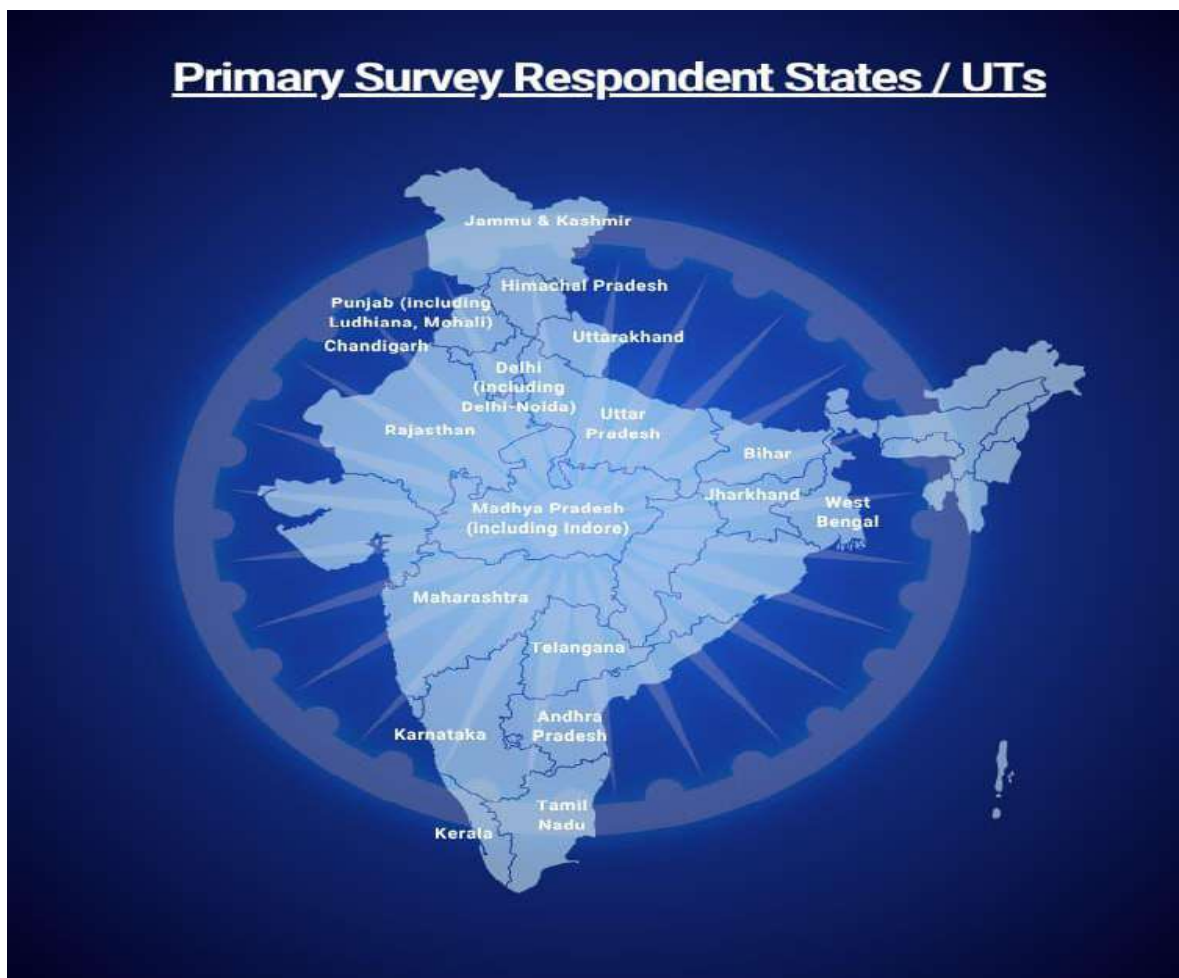






Figure E2: Google forms respondent states

Details of Field Visits Undertaken

Apart from the survey tool, interviews were conducted in person as well as in a hybrid mode with MeitY officers and PMU staff. The project team, headed by Prof. Charru Malhotra, also undertook field visits across five states from December 2024 to May 2025 (see Table E4 for the *state selection criteria*). During these visits, the project team conducted in-person observations and detailed interviews with KIAs, as well as training partners and industry representatives. Additionally, focus group discussions were held with beneficiaries, trainers, and employers to gather qualitative insights.

The table E4 sets out the site-selection criteria applied to prioritise field visits and monitoring for this assessment. It foregrounds geographic representation across India's North, South, East and West regions; implementation maturity, encompassing both nascent and well-established state schemes; training activity volume, emphasising centres with substantial enrolment and certification throughput; and stakeholder engagement, where the presence of capable Key Implementing Agencies, State Implementing Agencies, training partners and industry linkages is assessed. Collectively, these criteria facilitate selection of a compact yet representative sample of sites that will reveal scalable practices, contextual drivers and implementation gaps.


Table E4 : State Selection Criteria Where Field Visits Were Undertaken

Criteria	Details
 Geographic Diversity	To cover North, South, East, and West in India
 Implementation Maturity	To visit early and mature scheme states
 Training Activity Volume	To visit High-enrolment and high-certification centres
 Stakeholder Engagement	To identify strong Key Implementing Agencies- (KIA), State Implementing Agencies (SIA), Training Partners (TP) & Industry

Purposive field visits were conducted between December 2024 and May 2025 to examine implementation modalities, stakeholder coordination and learner outcomes across a representative mix of national agencies, state implementing bodies, training providers and industry partners. These engagements combined site inspections, programme-documentation review and in-depth focus group discussions to triangulate evidence on scalability, delivery challenges and transferable practices, with attention to geographic spread and variation in implementation maturity. The Key Implementing Agencies and programme management units engaged during the fieldwork , NIELIT, TSSC, ESSCI, the MeitY PMU and the respective State Implementing Agencies (SIAs) , are listed in **Table E5** below.

Table E5 : Details of Field Visits

S. No.	State/Agency	Date of Visit	Training Centres/Industries Visited
1	Key Implementing Agency (KIA)	Dec 2024 – Jan 2025	NIELET, TSSC, ESSCI
2	Uttarakhand	Jan 20-21, 2025	Asset Infotech, SLOG Solutions, Parivartan
3	Punjab	Feb 20-22, 2025	Focalty & Netplus Skill Development, Vidya Care (VC Edu Skills), IRS Learning, ICAIL, Mohali
4	Telangana	Apr 21-27, 2025	Shift Technologies, TechKnowledge Development Pvt. Ltd., RS Tele Services, Colour Sky Technologies (ACT Fibernet), CorpOne, Ranjeet Software Technologies, Bhagwati Industries (Micromax), Intelants Consultants, Surya Tech Solutions, Vasavi Group Skill Up, Data Pro, Schneider Electric
5	Maharashtra	May 24-28, 2025	Funfirst (PG Industries, Altrust Technologies), Saishwari Foundation, Gargi, Maitrey Sanstha

 Details of KIAs/PMUs/SIAs	NIELIT, TSSC, ESSCI, MeitY PMU, SIAs	In-depth FGDs
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2.3 FINDINGS

The review of secondary sources for the ESDM schemes draws on domestic policy frameworks, market insights, academic studies, and global benchmarks from Taiwan, Japan, and the US. The findings point to an urgent need for regular curriculum updates to match rapid advances in AI, ML, 5G, FPGA, robotics, and semiconductor technologies. International experience shows that strong industry–academia linkages, backed by premier technical institutions and R&D hubs, ensure emerging research translates into advanced training.

Effective models pair this with immersive delivery methods like structured apprenticeships, “place-and-train” programmes, and employer partnerships, alongside frequent skill assessments, faculty upskilling, and integration of sustainability and green manufacturing skills. Incentivising industry participation and recognising high-performing training providers expand talent pipelines. Robust governance — through digital verification, milestone-based funding, and automated certification — boosts transparency, while targeted outreach with stipends and mentoring ensures inclusion. Ultimately, a blend of policy support, private-sector engagement, and technology-enabled delivery is key to a future-ready ESDM skill ecosystem.

Findings Using Secondary Sources

Launched in October 2013, Scheme I was designed to enhance employability in the ESDM sector by supporting states and UTs in establishing robust, NSQF-aligned training programmes and infrastructure. It expanded its course portfolio, adopted employer-linked delivery models, and engaged leading KIAs for implementation across eight states (Figure E3).

Scheme 1 – Financial Assistance to Select States/UTs for Skill Development in ESDM Sector



Figure E3: Overview and Performance Outcomes of Scheme 1

Launched in December 2014, Scheme 2 was conceived as a centrally coordinated, PMU-driven programme to deliver NSQF-aligned training, employability skills and on-the-job exposure at national scale. The figure below (Figure E4) summarises its operational features , a first-come, first-serve enrolment architecture managed by NIELIT with implementation support from ESSCI and TSSC, and key outcomes: 385,303 enrolments, 385,301 trained, 284,802 certified and 97,608 successful placements (as of Nov 2024). These results evidence substantial numeric reach and placement throughput under a centralised delivery model,

while the certification-to-enrolment ratio suggests opportunities to strengthen completion support and employer linkages to improve per-trainee conversion (Figure E4).

Scheme 2 – Financial Assistance to Select States/UTs for Skill Development in ESDM Sector



Objectives

Approved in Dec 2014.



Key Highlights



Outcomes (as on Nov 2024)

<ul style="list-style-type: none"> Facilitate the creation of a comprehensive ecosystem for ESDM skill development across the country. Develop digital skills and support the establishment of training programs aligned with industry needs. Provide financial assistance for skill development for 3,28,000 persons in the ESDM sector, improving the employability of students and unemployed youth nationwide. 	<ul style="list-style-type: none"> Centralized PMU-driven ‘first-come, first-serve’ check-out system by NIELIT. Inclusion of Employability Skills, On-the-Job Training, NSQF-aligned courses. Key Implementing Agencies: NIELIT, ESSCI, TSSC. 	<ul style="list-style-type: none"> 385303 candidates enrolled. 385301 trained, with 284802 certified. 97608 candidates successfully placed.
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Figure E4: Overview and Performance Outcomes of Scheme 2

Comparative Analysis of Scheme 1 and Scheme 2

Scheme 2 operates at a far larger scale, enrolling over 3.5 times more candidates than Scheme 1 and delivering significantly higher certifications and placements. Scheme 1, however, achieves a higher certification rate (79.5% vs. 73.9%), indicating stronger retention and assessment success. While Scheme 2’s FY 2023–24 placement surge reflects strong employer linkages, Scheme 1’s steadier performance suggests tighter pipeline management. Combining Scheme 2’s outreach with Scheme 1’s efficiency could optimise both scale and quality (Figure E5).

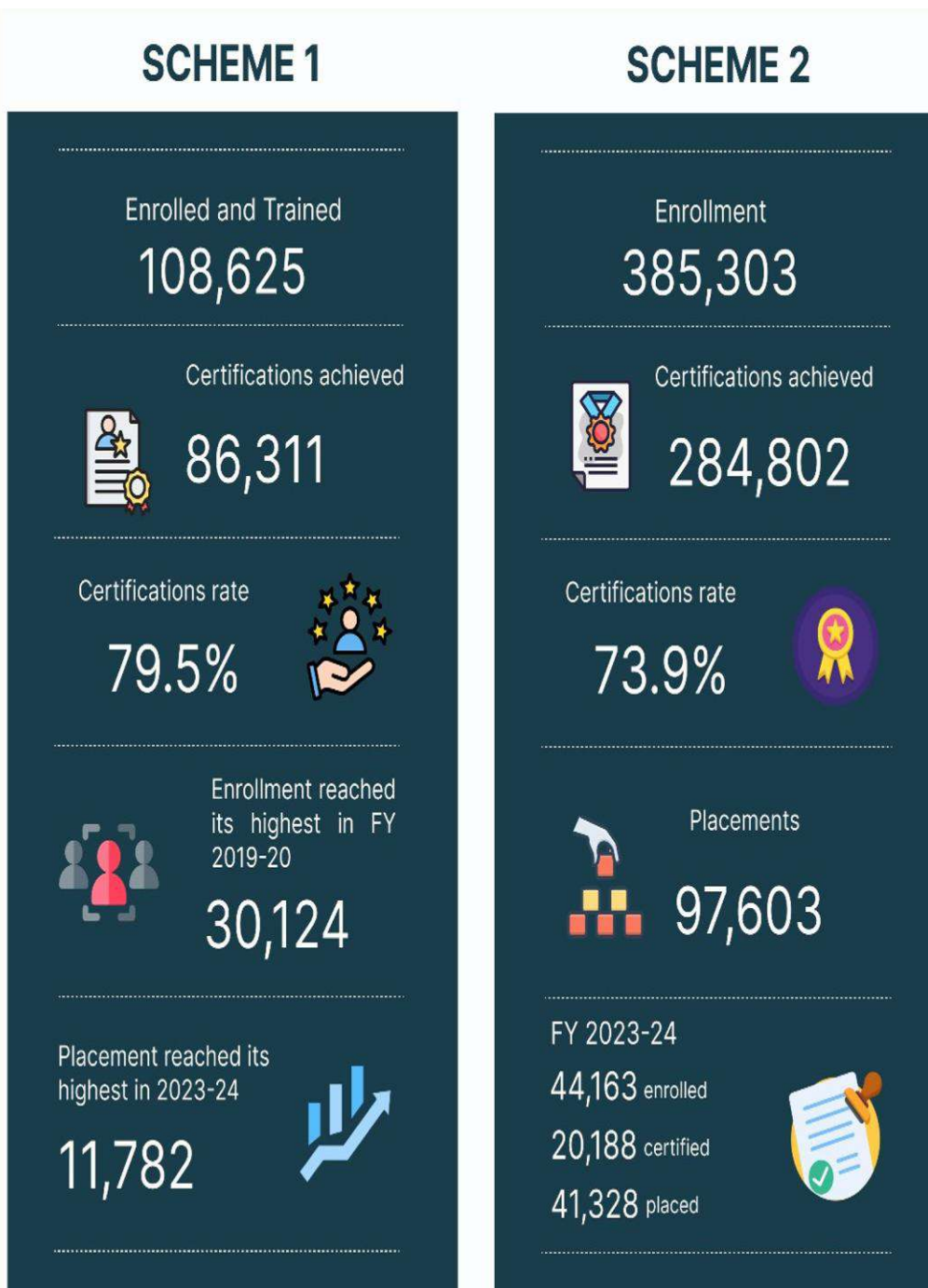


Figure E5: Comparative Performance of Scheme 1 and Scheme 2

3.1 Stakeholders' Findings Using Google Forms (REES Framework)

a. From Training Partners

1. Relevance of Training Programs

- Wide array of courses offered across both Schemes, aligned with ESDM industry needs (e.g., FTCP, CHMT, Line Assembler, OSP Supervisor).

- Strong industry alignment confirmed by 89.7% of training centres, with courses tailored for manufacturing and service roles.

2. Effectiveness of Training and Placement

- 4.94 lakhs trained, 3.53 lakhs certified, and 1.31 lakhs placed (June 2024).
- Place and Train model achieved an 86.09% placement rate (62,273 out of 72,330 candidates).
- High satisfaction (~97%) with the scheme's role in boosting employability of marginalized groups.

3. Quality of Infrastructure and Delivery

- 79.3% respondents confirmed centres have adequate equipment and teaching aids.
- 66% acknowledged significant improvements in training infrastructure.
- 75.9% rated trainer remuneration as satisfactory, supporting quality instruction.

4. Portal Efficiency and Monitoring

- Portal rated Excellent by 55.2% of respondents, highlighting its role in program management.
- 82.8% confirmed its effectiveness in monitoring candidate progress.
- Suggestions for portal improvement include:
 - Incorporation of Industry Demand Information.
 - Improved UI/UX Navigation.
 - Tools for locating the Nearest Training centres.

5. Social Impact and Sustainability

- Strong contribution to marginalized communities, with 97% affirming the scheme's role in boosting their employability.
- High satisfaction (over 90%) with long-term employability benefits.
- Industry linkages confirmed as highly relevant by 96.6%, facilitating job-aligned training.

b. From End-Beneficiaries (Trainees)

Profile and Outreach of End-Beneficiaries

- Age Group: Strong participation from the 18–25 category (59.3%), followed by 26–35 (36%), indicating the scheme’s effectiveness in reaching early-career candidates.
- Social Category: General (48.3%), OBC (19.1%), SC (17.9%), ST (10.3%), and EWS (4.4%), confirming broad inclusion across social groups.
- Gender Representation: Male respondents comprised 75%, with 25% female participation, underscoring the need for targeted efforts to bridge the gender gap.
- Educational Background: Predominantly 12th pass (61%), followed by 10th pass (15%), and Graduates (16%), making the scheme highly relevant for school and college leavers.
- Employment Status: The majority were unemployed (77%), followed by students (23%), indicating strong scheme uptake among those seeking entry or re-entry into the workforce.
- Geographic Reach: Nationwide coverage across North, South, East, and West India, including Union Territories, demonstrating the scheme’s role in fostering regional equity.

1. Training and Curriculum Effectiveness

- **Relevance:**
 - 97.1% rated the curriculum highly relevant (Excellent/Good).
 - 97% rated the ESDM program as Excellent or Good for its overall quality and effectiveness.
- **Quality of Delivery:**
 - 99.3% affirmed training met their learning needs and objectives.
 - 98.3% of respondents rated the training materials as relevant and aligned with industry needs.
- **Access and Support:**
 - 99.2% confirmed ease of access to training.
 - 93.9% are satisfied with the training resources, indicating a robust infrastructure.
 - 99.5% confirmed satisfactory support for disadvantaged candidates.

2. Impact on Employability and Skills Development

- Employability: 99.3% confirmed that training enhanced their job prospects.
- **Confidence and Skills Development:**

- **93.2%** felt more confident and job-ready post-training.
- **93.6%** confirmed alignment of training with industry standards.
- **Placement and Growth:**
 - 96.9% rated placement outcomes as Excellent or Good.
 - 95.6% expressed strong belief in long-term career benefits.
 - 99.8% acknowledged the scheme's role in facilitating access to relevant job opportunities.

4. Support Mechanisms and Governance

- **Grievance Redressal:** 73% rated the grievance mechanism as effective, highlighting trust and accountability within the scheme.
- **Beneficiary Endorsement:** An overwhelming majority expressed their willingness to recommend the scheme to peers, underscoring its role as a trusted and impactful skill development initiative.

c. From Industry Partners

1. Strong Industry Participation and Diversity

- **Sector Representation:** Feedback was received from industries across Electronics Manufacturing, IT & ITES, Telecom, Solar, Trading, and BPO.
- **Company Size:**
 - 25% of firms were small enterprises (turnover <₹5 crore),
 - 50% medium-sized (₹10–₹1000 crore), and
 - 25% large enterprises (turnover >₹1000 crore), including Telecom firms (~₹12,000 crore).
- **Implication:** The scheme encompasses a diverse range of industry sizes and sectors, making it an inclusive and comprehensive initiative.

2. Workforce Integration and Hiring Trends

- **Sectoral Impact:** Strongest absorption observed in Telecom–BPO (2,500 hires), BPO (1,179 hires), and Electronics Manufacturing (1,000 hires).
- **Limited Hiring:** IT (150), Trading (40), and specific manufacturing sub-sectors (<100 hires) indicated weaker alignment between curriculum and industry requirements.
- **Observatory Period:** ~12.5% firms hire fewer than 50 candidates, relying on probation or observation due to skill mismatches.
- **Implication:** The scheme is highly effective for electronics manufacturing and telecom services, with scope for curriculum re-alignment in IT and Trading sectors.

3. Long-Term Employment and Workforce Sustainability

- 75% firms confirmed offering long-term permanent roles (1–2-year probation), highlighting the scheme’s role in nurturing a stable workforce.
- Higher long-term absorption in Telecom–BPO, BPO, and Electronics Manufacturing sectors versus IT, Solar, and Trading, pointing to the need for sector-specific skill enhancement.

4. Curriculum Relevance and Industry Involvement

- **Relevance:** 55% rated training as “Relevant”, 30% as “Highly Relevant”, indicating strong satisfaction with curriculum design.
- **Scope for Improvement:** 15% rated training as “Slightly Relevant”, suggesting opportunities for deepening practical exposure and aligning with emerging technologies (AI, IoT, semiconductor design).
- Strong industry involvement via:
 - **Sector Skill Councils (SSCs)** (ESSCI, TSSC),
 - **Expert Committees** for curriculum design, and
 - Regular updating of courses (99 NSQF-compliant offerings) based on industry feedback.

5. Impact on Productivity and Cost Efficiency

- 100% of firms confirmed a reduction in training costs (10–20%) due to the pre-skilled candidates from the scheme.
- 90% rated the scheme as positively impacting workforce productivity, citing improved on-the-job performance and rapid role adaptation.
- 95% confirmed ESDM-trained candidates exhibited better job readiness and longer retention.

6. Challenges Identified by Industry

- **Soft Skills Gap:** Need for enhanced focus on teamwork, communication, and problem-solving.
- **Placement and Certification:** Minor delays were reported in candidate allocation and certificate issuance.

3.2 Key Findings from Field Visits

On-the-ground consultations with NIELIT, ESSCI and TSSC (Figure E6) highlight a clear preference for a place-and-train, LOI-driven model that better aligns skilling with employer needs and measurably boosts employability. TSSC praised NCVET-certified courses for closing the gap between academic credentials and industry-specific skills, while ESSCI cautioned that rigid administrative procedures and a non-intuitive portal discourage large firms from participating. All agencies flagged slow LOI approvals and delayed fund disbursements as major operational bottlenecks that undermine training partners' motivation. Stakeholders recommended regular curriculum updates, clearer industry incentives, and faster payments to ensure sustainable, scalable impact.

MeitY-KIA: NIELIT- ESSCI- TSSC

Industry-Relevant Training through Place-and-Train Model
 → NIELIT and TSSC emphasized that LOI-based, demand-driven training ensures better job alignment and enhances employability.

Bridging Academia and Industry Skill Gaps
 → TSSC curates NCVET-certified courses and enables job-readiness even for highly qualified candidates lacking industry-specific skills.

Barriers to Large-Scale Industry Participation
 → ESSCI noted that rigid administrative processes and a non-intuitive portal deter large firms from engaging in the scheme.

Operational Delays Impact Effectiveness
 → All KIAs highlighted slow LOI approvals and fund disbursement delays as demotivating factors for training partners.

Towards a Sustainable, Evolving Ecosystem
 → KIAs recommend regular curriculum updates, industry incentivization, and timely payments to ensure long-term stakeholder commitment.



Figure E6: Field Visit Insights from NIELIT, ESSCI and TSSC

Field visits to Asset Infotech, SLOG Solutions and Parivartan in Uttarakhand (Figure E7) found mixed course quality, with NIELIT's CHMT 'O' course emerging as the preferred option. Industry partners reported the training to be relevant and providers used creative local outreach (pamphlets, social-welfare tie-ins) to attract learners. Nonetheless, persistent operational issues, delays in fund disbursement and batch approvals, weak exam accountability and outdated assessments, and unclear certification responsibilities, limit effectiveness and hinder scaling.

Uttarakhand

Centers Visited	Key Insights
<ul style="list-style-type: none">• Asset Infotech• SLOG Solutions• Parivartan	<ul style="list-style-type: none">• Mixed course quality; NIELIT's CHMT 'O' course preferred• Industry partner (Strategic Marketing) finds training relevant• Creative outreach (pamphlets, social welfare tie-ins)
Challenges	
<ul style="list-style-type: none">• Delays in fund disbursement and batch approvals• Weak exam accountability and outdated assessments• Lack of clarity on certification responsibilities	



Figure E7: Uttarakhand — Field visit insights

Field visits to Focalyt & Netplus Skill Development, Vidya Care (VC Edu Skills), IRIS Learning and ICAI Mohali (Figure E8) confirm a strategic shift to a “Place-and-Train” (RTP) model, supported by employer tie-ups (e.g., Jio, Airtel) and targeted community mobilisation through Gram Pradhans. While industry linkages facilitate direct placements, programme effectiveness is constrained by migration reluctance and limited accommodation support, coordination shortfalls among PMU–SSC–KIAs, and irregular stipends with delayed fund releases factors that adversely affect trainee retention.

Punjab

Centres/Industries Visited:

- Focalyt & Netplus Skill Development
- Vidya Care (VC Edu Skills)
- IRIS Learning
- ICAI, Mohali

Key Insights:

- Shift from “Train and Place” to “Place and Train” (RTP)
- Ties with companies like Jio, Airtel for direct placement
- Community-level mobilization through Gram Pradhans

Challenges:

- Migration reluctance; lack of Accomodation support
- Coordination gaps among PMU-SSC-KIA
- Inconsistent stipends and delayed fund release
- Student retention is difficult without financial incentives



Figure E8: Punjab Field visit insights

Field visits across Telangana (Figure E9) (SHIFT Technologies, RS Tele Services, CORPOne, Bhagwati Industries, Surya Tech Solutions, Data Pro) show strong uptake of futuristic, industry-aligned courses (AI/ML, 5G) and a mix of Train-and-Place and Place-and-Train models. Programs with customized, hands-on curricula report high placement success and notable hires (e.g., ₹8 LPA), supported by corporate provision of stipends, accommodation and internships. Persistent barriers include lengthy portal and fund disbursement delays (reported up to two years), slow certification/assessment processes, syllabus-role mismatches, candidate retention issues during OJT, documentation hurdles for DBT, SEZ access restrictions, and limited career support for migrant trainees.

Telangana

Centres/Industries Visited

- SHIFT Technologies - Tecknowledge Development Pvt. Ltd.
- RS Tele Services - Colour Sky Technologies (ACT Fibernet)
- CORPOne - Ranjeet Software Technologies
- Bhagwati Industries (Micromax) - Intelants Consultants
- Surya Tech Solutions - Vasavi Group Skill Up
- Data Pro - Schneider Electric

Key Insights / Observations

- Strong adoption of futuristic courses (AI, ML, 5G) tailored to industry needs
- Use of both Train-and-Place and Recruit-Train-Deploy (RTD) models
- High placement success in programs with customized, hands-on curricula
- Effective mobilization through NGOs, ITIs, and college MoUs
- Corporate involvement extends to stipends, accommodation, and internships
- Notable success stories (e.g., SHIFT placing candidates with ₹8 LPA offers)

Challenges Faced

- Portal and fund disbursement delays (up to 2 years reported)
- Certification and assessment delays impact placement timelines
- Mismatch between syllabus and evolving tech roles
- Difficulty in retaining candidates, especially during OJT phase
- Documentation hurdles in DBT process (bank statements, payslips)
- Access restrictions in SEZs hinder on-site training delivery
- Language barriers and lack of career support for migrants



Figure E9: Telangana — Industry-aligned training and key challenges.

The Maharashtra (Figure E10) visit covered multiple training and industry centres, highlighting strong rural outreach and a functional “Train and Place” employment model. Effective performance tracking was observed through RAG methodology, but practical training often diverged from theoretical curricula. Challenges include limited credibility of ESDM certifications, outdated administrative systems, long assessment delays, and high operational costs without adequate pre-financing for advanced courses.

Maharashtra

Centres/Industries Visited:

- Funfirst Foundation (PG Industries, Altrust Technologies)
- Saishwari Foundation
- Gargi Foundation
- Maitreya Sanstha

Key Insights:

- Effective outreach in tribal/rural belts
- “Train and Place” model is preferred and functional
- Strong performance tracking using RAG methodology
- Practical training misaligned with theoretical curriculum

Challenges:

- ESDM certification lacks national credibility
- Outdated portal UI; delays in enrolment and fund disbursement
- Long wait times for assessments
- High operational costs and lack of pre-financing for advanced courses



Figure E10: Maharashtra — Rural outreach, Train-and-Place model

3. SWOT Analysis of the ESDM Two Schemes

The SWOT analysis of ESDM Schemes (E11) demonstrate strong institutional depth, social inclusion, and outcome-oriented design, with high training-to-placement conversion rates, cost savings, and standardized curricula. However, weaknesses include certificate delays, limited curriculum updates for emerging technologies, and operational bottlenecks in portals and fund disbursement. Opportunities lie in policy alignment, tech modernization, modular advanced courses, upgraded digital infrastructure, and start-up partnerships. Key threats include supply chain vulnerabilities, rural access gaps, rapid tech changes, and heavy dependence on government funding without strong PPP models.

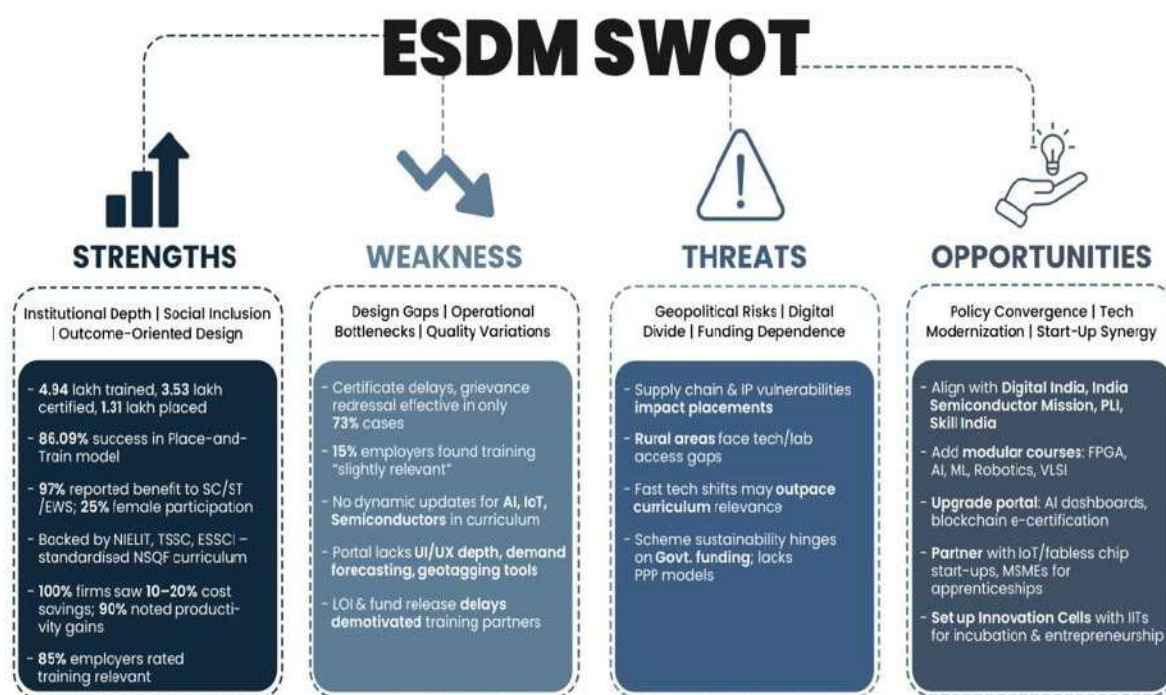


Figure E11: SWOT Analysis of ESDM Schemes

4. Recommendations

Based on the Key Findings and Observations, the following recommendations have been framed. They are organized into Short-Term (1–2 Years) and Long-Term (3–5 Years) priorities, with direct links to the relevant findings:

I. SHORT-TERM RECOMMENDATIONS (1–2 Years)

The report’s Short-Term (1–2 year) recommendations set out eleven targeted interventions to secure rapid, measurable improvements by strengthening the ESDM ecosystem and curriculum-certification alignment; instituting data-driven governance, transparency, and rigorous partner vetting; deepening industry collaboration and institutional capacity; and accelerating modular digital enablement, monitoring & evaluation, place-and-train models, and pragmatic financing mechanisms. These measures are calibrated for rapid implementation, prioritising pilots, performance-based empanelment and milestone-linked disbursement, to deliver demonstrable outcomes within 12–24 months.

1. Strengthening ESDM Ecosystem

Create a robust ESDM ecosystem



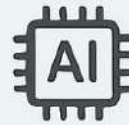
Mapping Levels (L1-L5)
To Actual Employment
Outcomes

**How training
levels translate
into employability
across sectors.**



**Common terminologies
and descriptors for better
industry alignment**

**Expand Beyond
IT/ITes: A 'Multi-
Sector' Approach**



**Expand course
offerings** aligned with
emerging technologies
such as

- Semiconductors,
- artificial intelligence (AI),
- Internet of Things (IoT),
- Advanced electronics manufacturing.

**Include non-IT
domains to broaden
the ecosystem and
enhance inclusivity**



2. Curriculum and Certification Alignment



Facilitate high-level coordination



Emphasizing On-the-Job Training (OJT)



ASSESSMENT METHODS
CO-DESIGNED WITH INDUSTRY



DISCONTINUE LEGACY OR OUTDATED COURSES



Periodic revision and revalidation of modules in consultation with Sector Skill Councils and industry experts.



PROMOTE NATIONALLY AND INTERNATIONALLY RECOGNIZED CERTIFICATIONS

3. Data-Driven and Technology-Led Governance

Digital Platforms for Efficiency



- Audits
- Fund disbursement
- Course monitoring

Onboarding Tech Partners



- Automation
- Authentication
- Analytics

AI-Powered Systems



- TP Performance Analytics
- Real-Time Course Demand Mapping
- Student Certification Verification

Technology as a Core Enabler

- Selection



- Implementation

- Evaluation



4. Transparency, Accountability & Vetting Mechanisms



Committee-based approval for LOIs to avoid bias



- Retired professionals
- New entrants
- Smaller institutions

- Proximity mapping (L1-L5)
- Aptitude-based assessments
- Certification and infrastructure capability

Clear inclusion criteria to ensure broad participation

TP Ranking System with transparent evaluation matrices based on infrastructure and outcomes



5. Industry Collaboration and Demand Mapping

Industry Collaboration



Industry Bodies

Chambers of Commerce



Technical Associations

To co-develop curriculum and estimate skilling demand

Continuous Employer Feedback Loop



Demand-Based Course Planning



6. Institutional Coordination and Capacity Building

Coordination Between Stakeholders

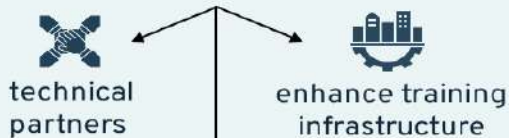


key national stakeholders

- NSDC
- MSDE
- NIELIT
- State Implementing Agencies to ensure program coherence.

Standards & Infrastructure

performance standards for



Particularly in Tier 2/3 cities.



CENTRAL OVERSIGHT COMMITTEE



review institutional performance



facilitate knowledge transfer

7. Enhance Monitoring and Evaluation Mechanisms

Set up a dedicated Monitoring and Evaluation Unit under



MeitY, staffed with domain



Analytics experts to ensure uniformity and quality



Periodic quality audits



surprise inspections of training centers to maintain high delivery standards.

Real-time monitoring



- Display state-wise implementation data
- enrolments
- certifications
- placements.

8. Refine the Place-and-Train Model

Annual Review Exercises



Institutionalize annual review exercises involving Knowledge Implementation Agencies (KIAs) and employers to analyze placement effectiveness and curricular relevance.



Expand High-Tech Training



Expand training offerings to include emerging and high-tech domains such as AI, ML, 5G, robotics, and FPGA design.

Digital Tracking for Impact

Use digital platforms to track candidate performance post-placement, offering data for long-term impact assessment



9. Address Financial and Operational Challenges

Milestone-Based Fund Disbursement



Shift to milestone-based fund disbursement to link financial releases with achievement of key deliverables.



Dedicated Execution Fund



Allocate 4–5% of total scheme outlay as a dedicated Execution Fund for SIAs/KIAs to manage audits, training, and digital infra.

Real-Time Digital Tracking

Use mobile and web-based platforms to track fund utilization and flag delays or anomalies in real time.



10. Streamline Portal and Documentation Processes

Mobile-First Portal Redesign

Redesign portals with mobile-first architecture, supporting digital signatures, multiple regional languages, and eKYC.



Automated LOI Processing



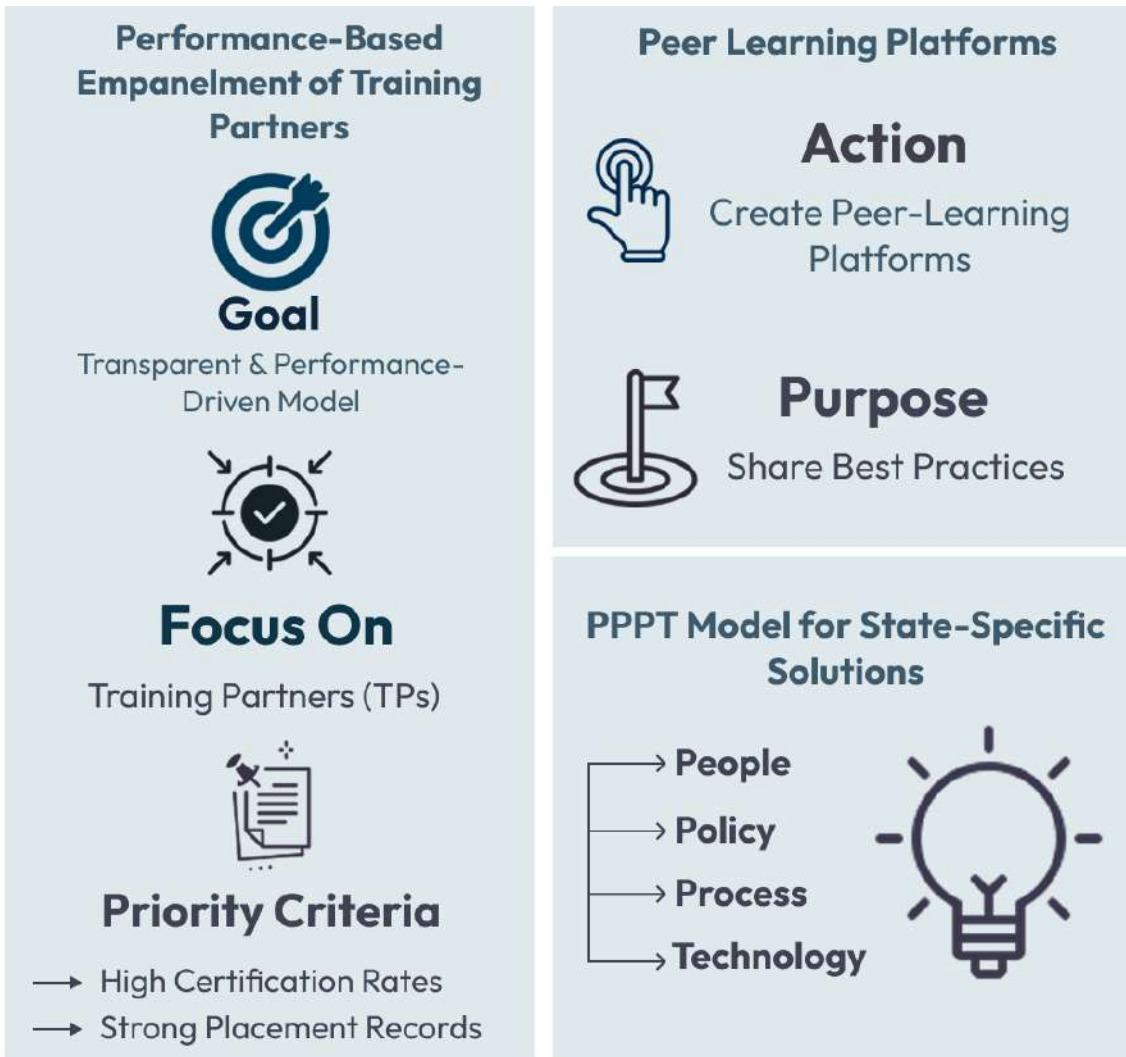
Fully automate LOI processing, with time-bound workflows, status tracking, and integrated approval systems.

API Integration for Verification

Leverage APIs from Aadhaar, EPFO, and UDYAM for seamless candidate onboarding and real-time verification.



11. Foster Training Partner Collaboration and Excellence



II. LONG-TERM RECOMMENDATIONS (3–5 Years)

The report prescribes a strategic, system-level programme over a 3–5 year horizon to consolidate short-term gains and enable transformational outcomes. Key thrusts include scaling advanced skilling and R&D in ESDM domains, institutionalising robust certification and quality-assurance frameworks, building integrated digital infrastructure and governance for demand-led delivery, and deepening industry-academia-research partnerships alongside sustainable financing models.

1. Align Training Programs with National Missions

<h4>Next-Gen Training Modules</h4> <p>Support Strategic National Missions</p>   <p>Aligned With</p> <ul style="list-style-type: none">• National Semiconductor Mission• Startup India• Make in India 	<h4>Co-Located Training with Industry</h4> <p>Co-locate training centers within electronics clusters for industry-aligned skill development.</p>  <h4>Empowering Grassroots Startups</h4> <p>Support grassroots startups with incubation, mentorship, and seed funding for marginalized communities.</p> 
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2. Maintain Long-Term Curriculum Evolution

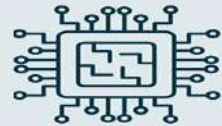
Institutionalize Annual Curriculum Reviews

- Annual reviews involving industry, academia & global experts to keep curriculum future-ready.



Build Centers of Excellence

Annual curriculum reviews with Support elite institutes in advanced tech domains



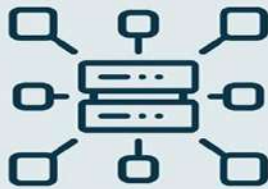
3. Build a Digital Infrastructure for Sustainability

Integrated ESDM Portal

Link national databases for seamless candidate tracking.



- Aadhaar
- EPFO
- UDYAM
- NSQF



Blockchain Certification



Secure, tamper-proof, portable digital credentials

AI-Driven Monitoring

AI for fund allocation, performance tracking & risk mitigation.



4. Focus on Social Impact and Sustainability

Empower Disadvantaged Groups



Provide stipends & support to boost participation among women, SC/ST, and EWS groups.



Incentivize Inclusive Hiring



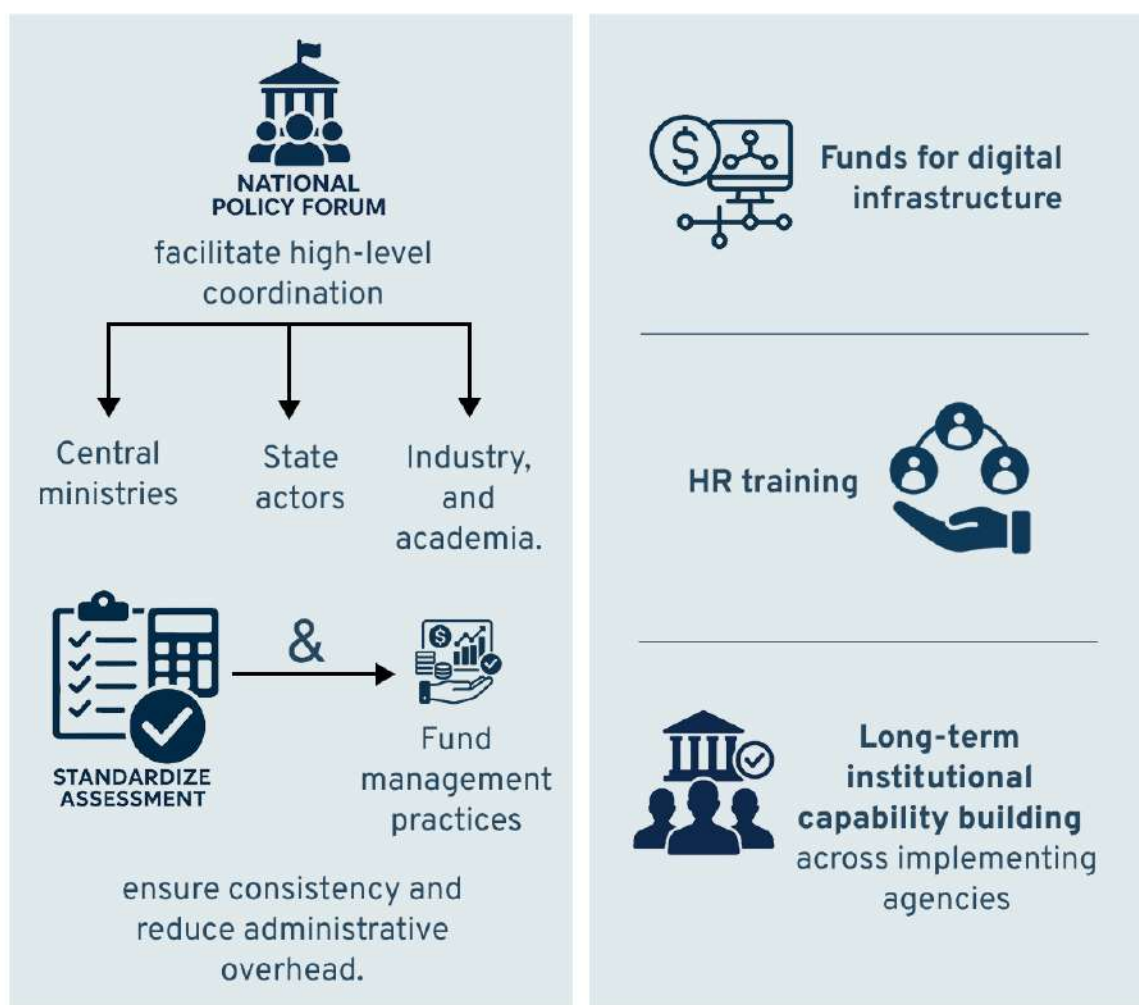
Offer financial & recognition-based incentives to industries hiring underrepresented groups.

Rural Innovation Hubs

Convert training into sustainable livelihoods via rural electronics hubs



5. Reinforce Governance, Coordination, and Fund Utilization Frameworks



Mapping Recommendations with Findings

The mapping of recommendations to findings outlines a phased approach to strengthening the ESDM schemes (Table E6). Short-term priorities focus on improving inclusivity, refining the Place-and-Train model, updating curricula, streamlining portals, and ensuring timely fund disbursement. Immediate actions also emphasize structured mentoring, enhanced industry engagement, and targeted incentives for SC/ST/EWS participation. Long-term strategies aim to deepen rural and regional outreach through national mission linkages, introduce advanced technology courses, expand R&D-driven industry–academia partnerships, and create robust digital and governance ecosystems. Together, these measures are designed to sustain employment impact, foster innovation, and ensure operational efficiency over time.

Table E6: Mapping of Recommendations with Key Findings

Findings	Short-Term Actions (1–2 Years)	Long-Term Actions (3–5 Years)
Inclusive Reach & Participation	<ul style="list-style-type: none"> Formalize industry MoUs focusing on rural, tribal, SC/ST, and EWS participation. Launch structured mentoring for SC/ST/EWS candidates. 	<ul style="list-style-type: none"> Build deeper links with national missions (NSM, Make in India) to expand rural and regional participation.
Strong Employment Impact	<ul style="list-style-type: none"> Refine Place-and-Train model for higher placement quality. Streamline fund disbursement for timely partner payments and better outcomes. 	<ul style="list-style-type: none"> Develop advanced courses (AI, FPGA, robotics) for future industry needs, aligning with global skill demands.
Industry-Aligned Curriculum	<ul style="list-style-type: none"> Annual curriculum review with industry and SSC input. Incorporate AI, ML, 5G, and other emerging technologies. 	<ul style="list-style-type: none"> Maintain long-term partnerships with industry and academia for semiconductor design, PCB fabrication, and AI hardware training.
Strong Industry Partnerships	<ul style="list-style-type: none"> Regular review and formalization of industry engagement. Reward high-performing training partners for quality and placement outcomes. 	<ul style="list-style-type: none"> Expand collaborations with IITs, IIITs, and C-DAC for long-term R&D linkages and advanced training ecosystems.
Portal Efficiency and User Experience	<ul style="list-style-type: none"> Simplify digital interfaces for LOIs and fund requests. Adopt e-signatures, chatbots, and standardized digital forms for seamless user experience. 	<ul style="list-style-type: none"> Integrate Aadhaar, EPFO, and UDYAM platforms for end-to-end digital verification, certification, and placement.

Social and Economic Impact	<ul style="list-style-type: none"> • Introduce stipends for trainees to improve participation. • Reward industries hiring SC/ST/EWS candidates to foster inclusion. 	<ul style="list-style-type: none"> • Launch seed grants, incubation centres, and entrepreneurship support for rural and SC/ST/EWS candidates.
Stronger Coordination and Governance	<ul style="list-style-type: none"> • Streamline LOI processing and approvals. • Involve training partners in policymaking and review. 	<ul style="list-style-type: none"> • Develop national review forums with KIAs, PMUs, SSCs, and industry representatives for ongoing policy alignment and improvement.
Efficient Fund Utilization	<ul style="list-style-type: none"> • Implement milestone-based fund disbursement. • Allocate 4–5% of project costs for KIAs/SIAs to enable robust monitoring. 	<ul style="list-style-type: none"> • Build institutional platforms and digital ecosystems for long-term financial accountability, transparency, and sustainability.

Conclusive Remarks

The ESDM skill development schemes have played a crucial role in equipping India’s workforce with industry-relevant skills, contributing to the country’s vision of self-reliance in electronics manufacturing. However, addressing existing challenges through policy adjustments, enhanced industry linkages, and robust monitoring mechanisms is imperative to maximise impact. Strengthening supply chain resilience, increasing local value addition, and aligning skill development with emerging global trends will be key to positioning India as a leader in electronic system design and manufacturing. By adopting a strategic, data-driven approach to workforce development, India can harness the full potential of its human capital, drive industrial growth, and emerge as a major player in the global ESDM landscape.

