



## Skilling youth for future jobs - A study

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### Abstract

The dynamic global employment landscape is experiencing rapid transformation due to technological advancements, automation, and the fourth industrial revolution. These shifts demand a highly adaptable, future-ready workforce equipped with relevant skills. In India, with over 62 % of its population in the working-age group and around 27 % between the ages of 15-29 years, the demographic dividend offers significant opportunities-if adequately skilled.

This research critically examines the importance of skilling youth for emerging jobs, focusing on the integration of vocational training, digital literacy, and industry-relevant competencies. Drawing on policy frameworks like the National Education Policy (NEP) 2020, the Skill India Mission, and the PM Kaushal Vikas Yojana (PMKVY), the paper identifies current gaps in the skill ecosystem, such as curriculum-industry mismatch, infrastructural deficiencies, and socio-economic barriers.

Using an analytical and descriptive approach based on secondary data from government reports, global indices, and industry surveys, this study highlights key trends, including the rise of the gig economy, green jobs, and AI-driven roles. It also provides strategic recommendations, such as integrating skill-based learning from early schooling, fostering government-industry-academia collaboration, and utilizing AI-powered personalized training tools.

The findings underscore that skilling youth is not merely an employment strategy but a national imperative for economic growth, social equity, and global competitiveness.

**Keywords:** Youth skills, employability, NEP 2020, vocational education, future jobs, digital skills

### Introduction

The global employment market is undergoing unprecedented changes driven by technological disruption, economic shifts, and evolving workplace demands. According to the World Economic Forum (WEF, 2023<sup>[10]</sup>, p. 8), nearly 85 million jobs may be displaced by automation by 2025, while 97 million new roles may emerge-primarily in the digital, green, and care economies.

For India, the challenge is twofold: addressing current unemployment (estimated at 7.8% in June 2024 by the Centre for Monitoring Indian Economy) and preparing its youth for the jobs of tomorrow. The sheer scale of India's demographic advantage makes it unique; the country adds nearly 10-12 million people to its workforce every year. Without adequate skill, this demographic dividend could turn into a demographic disaster.

Technological advancements such as Artificial Intelligence (AI), Machine Learning (ML), Big Data Analytics, Blockchain, Cloud Computing, and the Internet of Things (IoT) are redefining industries. The Fourth Industrial Revolution is characterized by the fusion of physical, digital, and biological systems, creating roles that demand a blend of cognitive, technical, and socio-emotional skills.

However, traditional education systems have struggled to keep pace with these demands, leading to a widening skills gap. Employers often report that graduates lack job-readiness skills despite holding academic degrees. This gap is particularly visible in engineering, IT, healthcare, and service sectors, where industries require cutting-edge technical expertise combined with problem-solving and communication abilities.

Another important issue is the mismatch between education and employability. Surveys by India Skills Report (2024) show that only 46% of graduates are employable compared

to a global average of 65%. This highlights the urgent need for reforms in both curriculum design and delivery.

The purpose of this study is to critically analyze the current status of youth skilling in India, explore emerging job trends, assess the effectiveness of existing policy frameworks, and propose actionable recommendations for bridging the employability gap.

### Objectives of the Study

1. To analyze the current status of youth employability and skills in India.
2. To identify future job trends and the skill sets they demand.
3. To study the role of national policies like NEP 2020 and Skill India in enhancing youth employability.
4. To explore challenges in implementing effective skilling programs.
5. To suggest strategic recommendations for improvement in the skilling ecosystem.

### Research Methodology

This study adopts an analytical and descriptive research design, relying entirely on secondary data.

- **Data Sources:** Reports from the Ministry of Skill Development and Entrepreneurship (MSDE), National Skill Development Corporation (NSDC), World Economic Forum (WEF), UNESCO, McKinsey & Company, NITI Aayog, and industry whitepapers.
- **Data Collection Tools:** Content analysis, policy review, and skill demand-supply mapping.
- **Scope:** The focus is on India, with comparative references to successful international models.

- **Limitations:** Dependence on secondary data may limit the scope for ground-level insights; primary surveys are suggested for future studies.

**Understanding the Concept of Skilling Youth**

Skill development refers to the process of equipping individuals with competencies, abilities, and knowledge required to perform specific tasks effectively. These skills can be classified as:

- **Foundational Skills:** Literacy, numeracy, and basic IT literacy.
- **Transferable Skills:** Problem-solving, communication, critical thinking, adaptability.
- **Job-specific Skills:** Industry-specific technical skills, such as coding, machine operation, or healthcare procedures.

India’s youth represent a demographic dividend that can boost economic growth if productively employed. However, without adequate skill, this demographic advantage risks becoming a socio-economic burden. Early skilling interventions, particularly in secondary and higher secondary education, are essential to prepare students for the transition from school to the workplace.

**Emerging Trends in Future Jobs**

The nature of work is undergoing rapid transformation due to several global and national factors. Some of the most significant trends are as follows:

1. **Automation and AI:** Roles in manufacturing, data processing, and routine administration are being automated. According to McKinsey Global Institute (2024 <sup>[3]</sup>, p. 27), nearly 60% of occupations globally have at least 30% of tasks that can be automated. In India, automation is impacting industries like textiles, automobiles, and logistics. At the same time, new opportunities are arising in AI engineering, machine learning operations, natural language processing, and data science. For example, Bengaluru has emerged as

India’s AI capital, employing over 60,000 professionals in AI-driven roles.

2. **Green Jobs:** Climate change mitigation is driving demand for renewable energy technicians, sustainability analysts, and waste management experts. India’s commitment to Net Zero emissions by 2070 will create more than 50 million green jobs by 2030 (NITI Aayog, 2023, p. 51). States like Rajasthan and Gujarat are leading in solar and wind energy projects, generating large-scale employment for rural youth trained in solar panel installation and maintenance.
3. **Gig Economy:** Platforms like Upwork, Fiverr, Zomato, Ola, and Swiggy have expanded freelance and short-term contractual work opportunities. According to the Boston Consulting Group (2022), India is the world’s fifth-largest gig economy, with nearly 15 million freelancers. Youth skilled in digital content creation, mobile app development, and digital marketing are increasingly taking advantage of this flexible model.
4. **Remote Work and Hybrid Models:** The COVID-19 pandemic accelerated the adoption of remote work, making digital collaboration skills essential. Companies like TCS and Infosys now operate on hybrid models, requiring employees to master tools like MS Teams, Slack, Zoom, and Asana. This trend is expected to continue, especially in IT, finance, and consulting sectors.
5. **Industry 4.0:** Integration of robotics, IoT, smart manufacturing, and blockchain is revolutionizing industrial job profiles. For example, Siemens and Bosch in India are increasingly adopting Industry 4.0 technologies, demanding engineers who understand automation, predictive maintenance, and digital twin technologies.

**Table 1:** Key Sectors and Skill Demands for Future Jobs

Sector	Emerging Roles	Required Skills
IT & AI	Data Scientist, AI Engineer, Cybersecurity Analyst	Coding, ML, Critical Thinking
Green Economy	Solar Technician, Climate Analyst	Renewable Energy, Data Analysis
Healthcare	Telemedicine Expert, Biotech Researcher	Digital Health Tools, Biology
Gig Economy	Freelance Content Creator, App Developer	Creativity, Platform Management
Manufacturing 4.0	Robotics Technician, IoT Engineer	Automation, Technical Operations

**6. Skilling Ecosystem in India**

India’s skill development architecture includes a wide range of government and private initiatives:

- **Skill India Mission (2015):** Aims to train over 400 million people by 2025. It has launched specialized sectoral skill councils to bridge industry requirements.
- **National Skill Development Corporation (NSDC)** A public-private partnership facilitating large-scale skill development projects. It collaborates with 600+ training partners and has trained over 3 crore youth.
- **NEP 2020:** Introduces vocational training from Grade 6, emphasizes coding, internships, and experiential learning (Ministry of Education, 2020 <sup>[5, 4]</sup>, p. 17).

- **PMKVY (Pradhan Mantri Kaushal Vikas Yojana):** - Offers short-term training and certification for youth. By 2023, more than 1.37 crore youth had been certified.
- **Industrial Training Institutes (ITIs):** With over 15,000 institutes across the country, ITIs focus on trade-specific training.
- **State-level programs:** Maharashtra’s “Kaushalya Setu” and Kerala’s “Additional Skill Acquisition Programme (ASAP)” are good models.
- **Private Sector Initiatives:** Infosys’ Global Education Centre in Mysuru, TCS iON’s digital learning programs, and Wipro’s Future Skills initiative are notable.

Despite these, challenges remain in implementation due to scalability, rural–urban divide, and lack of quality monitoring.

## 7. Skill Gaps and Employability Challenges

Despite multiple initiatives, challenges persist

- **Curriculum–Industry Mismatch:** Academic curricula often lack alignment with industry needs (NSDC, 2021, p. 45). For instance, many engineering colleges still teach outdated software languages not demanded by the industry.
- **Practical Exposure Deficit:** Traditional teaching methods offer limited hands-on training. Only 35% of engineering graduates report having done internships.
- **Digital Divide:** Rural students often lack access to devices and high-speed internet. According to UNESCO (2022 <sup>[9]</sup>, p. 31), only 24% of rural households in India have internet access.
- **Socio-economic Barriers:** Gender biases, affordability issues, and cultural attitudes towards vocational careers discourage participation. In many rural families, vocational education is still seen as “inferior” compared to academic degrees.
- **Quality and Standardization Issues:** Variations in training quality and inconsistent certification credibility weaken employability.
- **Chart 1: Youth Employability Rate (India vs Global Average, 2024)**
  - India ~ 46% employable
  - Global Average ~ 65%

## 8. Case Studies and Real-Life Examples

**TCS iON Digital Learning Hub:** Provides free and low-cost online skill courses to students and professionals. Over million learners benefited during the pandemic.

- **Google Career Certificates:** Industry-recognized credentials in IT support, UX design, and data analytics, offering job pathways in collaboration with Indian companies.
- **Germany’s Dual Education System:** Integrates classroom learning with paid apprenticeships, ensuring strong industry linkage. India can replicate this model.
- **Skill Hub Initiative (NEP 2020):** Targets rural youth, offering blended online and offline vocational training through district skill hubs.
- **Green Energy Success Story - Rajasthan:** Solar technician training programs have enabled rural youth to secure stable jobs in renewable energy firms.
- **Kerala’s ASAP (Additional Skill Acquisition Programme):** Introduced vocational skills in higher secondary education; over 7 lakh students trained.
- **Japan’s Kaizen Training Model:** Adopted in Indian MSMEs, focusing on continuous improvement and workplace discipline.

## 9. Policy Analysis: NEP 2020 and Skilling

**NEP 2020 is a transformative policy with significant skilling provisions:**

- Vocational education integrated from Grade 6 (p. 16).
- Focus on experiential learning, internships, and coding.
- Multiple entry–exit options to enable flexible learning.
- Entrepreneurship, life skills, and critical thinking as core curriculum components.
- Strengthened industry linkages for work-based learning.

## 10. Comparative models provide lessons

- **Singapore’s SkillsFuture:** Lifelong learning vouchers for every citizen.
- **Australia’s VET system:** Partnership between government and industry ensures demand-driven training.
- **Finland’s Education Model:** Emphasizes creativity, critical thinking, and holistic development over rote learning.

## 11. Benefits of Skilling Youth for Future Jobs

- **Economic Growth:** Increased GDP through higher productivity.
- **Innovation:** Skilled workers drive technological and process innovations.
- **Social Inclusion:** Opportunities for marginalized groups.
- **Global Competitiveness:** Indian youth can access global job markets.
- **Reduced Unemployment:** Aligns education with employable skills.

## 12. Challenges in Implementation

- Infrastructure shortages in rural training centres.
- Resistance from parents and students towards vocational education.
- Weak monitoring of training outcomes.
- Faculty shortage in specialized fields.
- Lack of robust career counseling services.
- Fragmentation between central and state programs.

## 13. Strategic Recommendations

1. Introduce skill-based curricula from middle school.
2. Enhance industry–academia collaboration for curriculum design.
3. Upskill teachers in emerging technologies.
4. Use AI-driven learning platforms for personalized training.
5. Launch awareness campaigns on vocational career benefits.
6. Offer financial incentives for companies providing apprenticeships.
7. Establish a National Digital Skills Repository to track credentials.
8. Promote women’s participation in STEM and vocational careers.
9. Strengthen public–private partnerships (PPP) for rural training.

10. Encourage start-up incubation centres in colleges.

#### 14. Limitations of the Study

- Reliance on secondary data restricts primary insights.
- Skill development outcomes vary across states, creating generalization challenges.
- Lack of longitudinal data on job placement post-training.

#### 15. Practical Implications

- Policymakers can design state-wise targeted strategies.
- Educational institutions can redesign curricula in partnership with industries.
- NGOs and private players can focus on rural skilling initiatives.
- Industry can adopt CSR-based skilling models for inclusive growth.

#### 16. Future Scope of Study

- Conduct longitudinal studies on training program outcomes.
- Compare state-level skilling performance.
- Evaluate AI-powered adaptive learning models.
- Analyze the long-term impact of NEP 2020 on youth employability.
- Explore global mobility opportunities for skilled Indian youth.

#### 17. Critical Discussion

The findings of this study clearly establish that skilling youth is both a challenge and an opportunity. The Indian skill development ecosystem has made significant progress through initiatives such as Skill India Mission, PMKVY, and NEP 2020, but persistent issues like curriculum–industry mismatch, inadequate infrastructure, and socio-economic barriers limit their effectiveness.

Comparative analysis with global models such as Germany’s dual education system and Singapore’s SkillsFuture reveals that strong industry–academia linkages, paid apprenticeships, and lifelong learning opportunities are essential for bridging the employability gap.

Moreover, while India has launched several large-scale programs, the quality of training and monitoring mechanisms remain inconsistent. There is also a rural–urban divide in digital access, creating unequal opportunities. If India aspires to become a global leader in the knowledge economy, it must prioritize early vocational integration, AI-driven personalized skilling platforms, and gender-inclusive participation in STEM fields.

This discussion reinforces that skill development is not an isolated policy tool but must be embedded within a holistic framework that includes education reforms, industry collaboration, and social awareness. Only then can India transform its demographic dividend into a sustainable engine for economic growth and social equity.

#### Conclusion

Skilling youth is not an optional policy choice but a national necessity in the era of technological disruption. India’s demographic advantage can only be leveraged through coordinated policy implementation, educational reforms, and inclusive skill development strategies. A future-ready workforce will not only strengthen India’s economic standing but also ensure social stability and equity.

Skilling youth is not an optional policy choice but a national necessity in the era of technological disruption. India’s demographic advantage can only be leveraged through coordinated policy implementation, educational reforms, and inclusive skill development strategies.

If India succeeds in integrating vocational training, digital literacy, and emerging technology skills with its traditional education system, it will not only secure employment for millions but also strengthen its position as a global knowledge and innovation hub. A future-ready workforce will ensure both economic prosperity and social stability in the decades to come.

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