VOCATIONAL EDUCATION FIRST.

United Nations Educational, Scientific and Cultural Organization

New Delhi Office
Cluster Office for Bangladesh, Bhutan, India, Maldives, Nepal and Sri Lanka

State of the Education Report for India 2020
Technical and Vocational Education and Training (TVET)

UNESCO Education Sector

Education is UNESCO's top priority because it is a basic human right and the foundation on which to build peace and drive sustainable development. UNESCO is the United Nations' specialized agency for education and provides global and regional leadership in education, strengthens national education systems and responds to contemporary global challenges through education, with a special focus on gender equality and Africa.

United Nations Educational, Scientific and Cultural Organization

Education Sector

The Global Education 2030 Agenda

As the United Nations' specialized agency for education, UNESCO is entrusted to lead and coordinate the Education 2030 Agenda – part of a global movement to eradicate poverty through 17 Sustainable Development Goals by 2030. Education, essential to achieving all of these goals, has its own dedicated Goal 4, which aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.' The Education 2030 Framework for Action provides a guideline for implementing this ambitious plan.

Education 2030

VOCATIONAL EDUCATION FIRST

State of the Education Report for India 2020

Technical and Vocational Education and Training (TVET)

Published by

UNESCO New Delhi Cluster Office
for Bangladesh, Bhutan, India, Nepal,
the Maldives, and Sri Lanka

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सत्यमेव जयते

Message

Minister
Ministry of Education
Government of India

It is indeed a pleasure to learn that UNESCO has produced the 'State of the Education Report for India 2020' focusing on the ever-important theme of Technical and Vocational Education and Training (TVET). With recent launch of the National Education Policy (NEP) 2020, the relevance of this report is enhanced even further as it provides useful inputs for implementing the ideas proposed in the NEP.

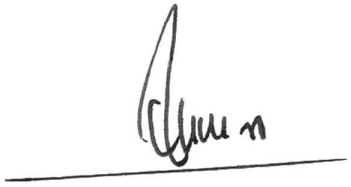
The National Education Policy embraces the Education 2030 Agenda and commits to expanding vocational education considerably across India starting from Grade 6 onwards to enable students to acquire necessary skills for further education and training. This integration of vocational education programmes into mainstream education in all educational institutions would ensure that every student learns at least one vocation and is exposed to several more including those involving Indian arts and artisanship constituting an important pillar of 'Lok Vidya'.

Further, the policy focuses on helping young students inculcate lifelong learning skills to cope with rapid pace of technological changes and on providing opportunities for learning from real life contexts that address their personal, social, and economic issues.

Various structural and policy changes introduced in the NEP are aimed at scaling up the provision and quality of vocational education. Some of these include the development of a National Curriculum Framework (NCF) and a National Higher Education Qualification Framework (NHEQF), strengthening school education boards for carrying out assessments of vocational courses, setting up of Skill Labs in schools in a hub-and-spoke model, emphasizing the professional development of vocational teachers through common National Professional Standards for Teachers (NPST) and offering of vocational courses through Open and Distance Learning (ODL) mode, among others.

Finally, a National Committee for the Integration of Vocational Education would be constituted by the Ministry to ensure that the ambitious targets set for mainstreaming of vocational education are achieved in an equitable, timely and effective manner.

I compliment UNESCO New Delhi on this publication which I hope would enable cross learning among the multiple stakeholders of the vast vocational education ecosystem and adoption of best practices towards the achievement of India's vision to skill, reskill and upskill.



Ramesh Pokhriyal 'Nishank'
Minister of Education
Government of India

सत्यमेव जयते

Message

Minister
Ministry of Skill Development and Entrepreneurship
Government of India

I am pleased to note that Technical and Vocational Education and Training (TVET) has been chosen as the theme for 'State of the Education Report for India 2020'.

Hon'ble Prime Minister, Shri Narendra Modi, has extolled the virtues of creating a robust skill training and entrepreneurship development ecosystem in India's upward journey to economic growth. In line with the vision of making India the 'skill capital of the world', the Ministry of Skill Development and Entrepreneurship (MSDE) has been steadfast in its mission to reinforce skill development efforts across the country.

Under Skill India Mission, we have been laying emphasis on TVET to provide lifelong learning opportunities to the young, enhance their prospects of employability and reduce the demand and supply gap in the workforce market. The Ministry's continuous efforts have been instrumental in enabling equitable access and better livelihoods through quality lifelong learning opportunities for all. The support of our valued partners has helped create an ecosystem that fosters greater participation of the youth in TVET initiatives and builds their capabilities.

Going forward, the Ministry's vision for the future rests on three key elements. First, to promote the integration of skilling and education to ensure that foundational and life skills are imparted to learners before they enter domain specific training programs to ensure better outcomes. Second, to enhance the focus on work-based learning and apprenticeship programs at employer sites to ensure learning by doing, and finally to expand skill development programs to micro, small and medium enterprises to ensure that the informal workers are also brought within their ambit.

I am positive the report with its in-depth analysis of the current state of TVET highlighting best practices and recommendations would provide useful guidance and serve as a reference tool for enhancing the policies and programmes related to skill development in India. My heartiest congratulations to UNESCO New Delhi on the launch of this publication and I truly applaud the Editorial Board members along with entire team involved in preparation of the report.

Mahendra Nath Pandey
Minister of Skill Development and Entrepreneurship
Government of India

Special thanks to artist Leon Löwentraut, Geuer & Geuer Art GmbH, and the YOU Foundation.

The campaign #Art4GlobalGoals was initiated by the young German artist Leon Löwentraut and Geuer & Geuer Art Gallery, with the support of UNESCO and the YOU Foundation. It aims to increase public awareness on the Sustainable Development Goals through the sale of hand-painted prints specially produced by Leon Löwentraut. Part of the proceeds of the #Art4GlobalGoals campaign supported this Report.

The painting above focuses on Sustainable Development Goal 14, which is about 'Life below water'.

Foreword

> “The COVID-19 pandemic has greatly stressed health infrastructure, labour markets and employment, exposing not only the major fault lines in the vocational education and training systems but also their raison d'être.”

Skills are increasingly becoming the new global currency of twenty-first century economies. The skills development agenda has taken centre stage not only in the global debates on the future of education but also within the Sustainable Development Goal 4 on quality education where technical and vocational skills for employment, decent jobs and entrepreneurship feature prominently.

Globally, developments in technology, demographic changes, as well as shifts towards lifelong learning approaches are pushing policymakers to rethink the scope and scale of national vocational education and training systems. In India too, the clarion call for skilling, upskilling and reskilling has been issued by Prime Minister Modi himself and is backed by comprehensive national policies.

Yet, while vocational education is steadily rising to the top of policy agendas, the capacity of systems to respond to multiple demands and to shape the future, is often limited. Much more needs to be done to address challenges related to quality, relevance, acceptability, inclusion, and the ever-increasing digital divide.

This year has also been unlike any other in recent memory. The COVID-19 pandemic has stressed health infrastructure, labour markets and employment to a degree never seen before. In a sense this has exposed not only the major fault lines in the vocational education and training systems but also their raison d'être.

On a more positive note, even the pandemic could not deter India from launching the new National Education Policy. It represents a landmark revision that comes after a gap of over 30 years and re-imagines vocational education for a potential transformation.

We therefore believe that this year's State of the Education Report for India holds special relevance as it aims to build a bridge between education and skills development systems in India.

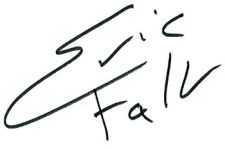
Prepared with us during the pandemic by a committed team from the Tata Institute of Social Sciences, the report draws on material gathered from numerous interviews with key stakeholders, including government agencies, training and assessment organizations, employers and trainers along with TVET experts in the field, and puts to use materials provided by them, backed up with extensive desk research of national and international literature.

Despite the challenges of the lockdown and the closure of training institutions, the report aims to capture the intense activity of the vocational education and training sector and highlights achievements and promising practices. It was carefully vetted and reviewed by a group of high-level Indian experts comprising the Editorial Board and I am most grateful to all members for their commitment, insight, and guidance.

We hope that the report will serve as a reference tool for enhancing and influencing the policies and programmes related to skills development in India. Its purpose would be truly served if TVET practitioners, policy makers and donors would consider the recommendations that the report proposes for planning their future engagements in the TVET sector in India.

I wish to extend my sincere thanks and appreciation to the American India Foundation (AIF), under the guidance of Mathew Joseph and the YOU Foundation of Germany led by UNESCO Special Ambassador Dr Ute-Henriette Ohoven, for their technical and financial support.

We look forward to continuing our collaboration with both institutions for the 2021 edition of our report, expected to focus on teachers.



Eric Falt
Director,
UNESCO New Delhi

Special thanks to the American India Foundation, whose financial and technical contribution supported this report.

The American India Foundation is committed to improving the lives of India's underprivileged, with a special focus on women, children, and youth. Working closely with local communities, AIF partners with NGOs to develop and test innovative solutions, and with governments to create and scale sustainable impact. Till date, AIF has impacted the lives of **6.7 million** people in India.

EDUCATION

DIGITAL EQUALIZER (DE)

Improving learning outcomes in government schools through technology

4,126,691
children empowered with interactive STEM learning experiences

LEARNING & MIGRATION PROGRAM (LAMP)

Access to continuous, quality education in areas of migration

583,877
children impacted by quality education opportunities

HEALTH

MATERNAL & NEWBORN SURVIVAL INITIATIVE (MANSI)

Reducing newborn mortality in rural India by training community health workers

133,932
newborns treated

LIVELIHOODS

MARKET ALIGNED SKILLS TRAINING (MAST)

Job-readiness training for unemployed youth

124,673
disadvantaged young people trained in workplace-readiness and industry skills

ABILITY BASED LIVELIHOOD EMPOWERMENT (ABLE)

Skills training for persons with disability

16,167
persons with disabilities trained in workplace-readiness and industry skills

AIF FELLOWSHIP

AIF FELLOWSHIP

Strengthening India's civil society through partnerships with talented young Americans and Indians

490
fellows in service with NGOs and social enterprises across India

AIF is grateful to Dave Sharma for support to AIF's programs and advocacy initiatives, especially towards making the publication of this Report possible.

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Acknowledgements

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The collaborative effort was guided and managed by Mr Mame Omar Diop, Head of the Education team.

From the time the initial concept was drawn up in 2019, Mr Manish Joshi diligently provided invaluable technical support and coordination for the report on behalf of UNESCO New Delhi, aided by Mr David Kuhn and Ms Charumati Haran, and interacted closely with the research team from the Tata Institute of Social Sciences (TISS) in Mumbai, comprising Dr Leena Chandran Wadia and Prof Neela Dabir as the main authors.

The editorial board was guided by Mr Eric Falt, Director and UNESCO Representative, and included Mr Venkata Subba Rao Ilapavuluri, Secretary to the Vice President of India; Dr KP Krishnan, Former Secretary, Ministry of Skill Development and Entrepreneurship; Ms Juthika Patankar, Additional Secretary, Ministry of Skill Development and Entrepreneurship; Dr Manish Kumar, MD and CEO, NSDC; Mr Mathew Joseph, Country Director, AIF; Dr Shyamal Majumdar. Former Head, UNESCO-UNEVOC; Mr Terry Durnnian, Chief - Education, UNICEF India; and Dr Vineeta Sirohi, Professor, NIEPA. The editorial board met three times to provide support and feedback to the research team.

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Fourth row (from left): Terry Durnnian, Chief of Education, UNICEF India | Dr Vineeta Sirohi, Professor, Department of Educational Administration, National Institute of Educational Planning and Administration (NIEPA) | Eric Falt, Director and UNESCO Representative, New Delhi



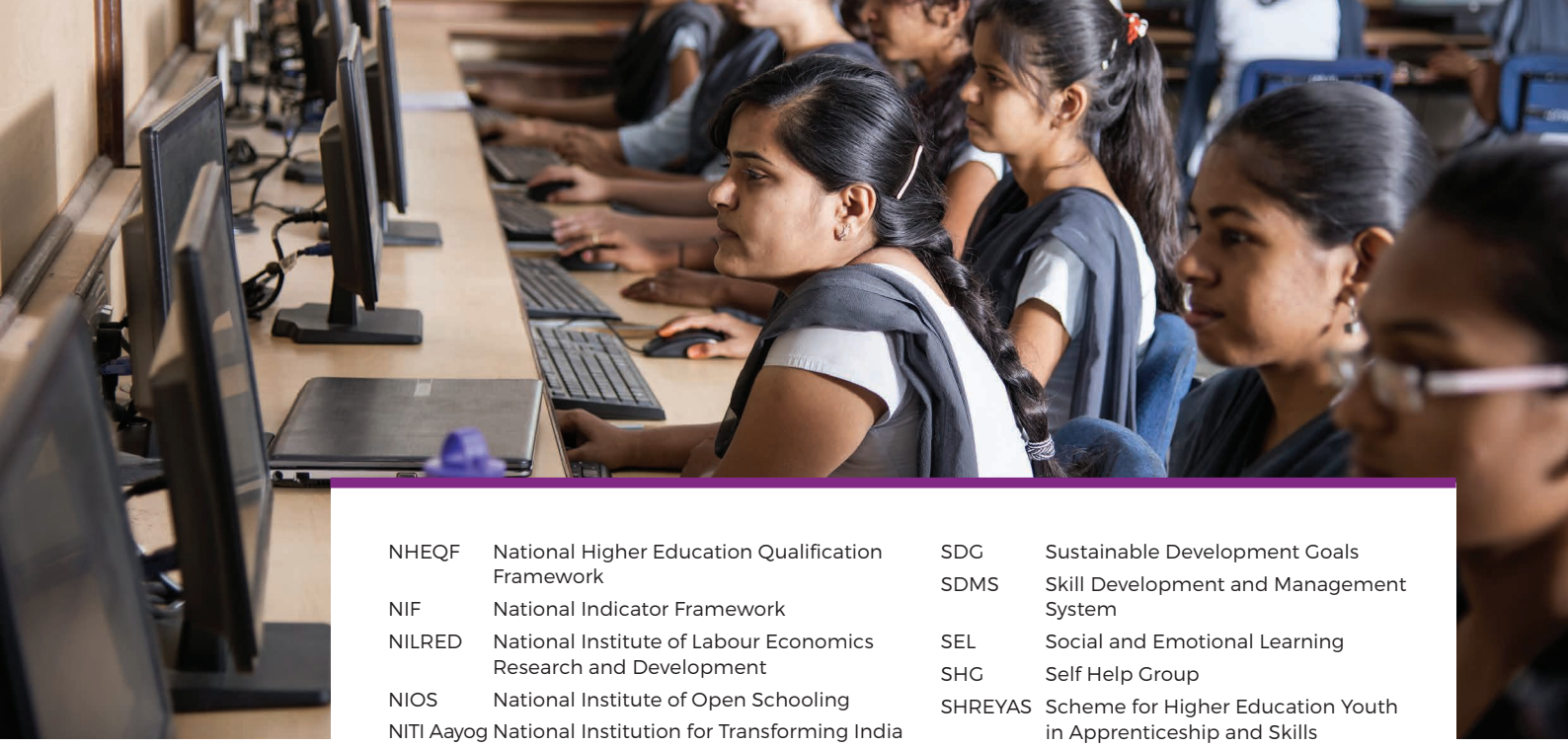







Abbreviations and acronyms

ABC	Academic Bank of Credits
ADB	Asian Development Bank
AIF	American India Foundation
AISHE	All India Survey on Higher Education
ASEEM	Atmanirbhar Skilled Employee Employer Mapping
BA	Bachelor of Arts
BCom	Bachelor of Commerce
BE	Bachelor of Engineering
BFSI	Banking Financial Services and Insurance
BSc	Bachelor of Science
BTech	Bachelor of Technology
BVoc	Bachelor of Vocation
CBSE	Central Board of Secondary Education
CCG	Career Counselling and Guidance
CFC	Common Facility Centre
CIVE	Central Institute of Vocational Education
CMIE	Centre for Monitoring of Indian Economy
COVID-19	Coronavirus disease 2019
CSCM	Centrally Sponsored Centrally Managed
CSS	Centrally Sponsored Schemes
CSSM	Centrally Sponsored State Managed
CSP	Community Skill Parks
CSR	Corporate Social Responsibility
CSTI	Construction Skills Training Institute
CTS	Craftsmen Training Scheme
CwDs	Children with Disabilities
DDU-GKY	Deen Dayal Upadhyaya Grameen Kaushalya Yojana
DEI	Dayalbagh Educational Institute
DGT	Directorate General of Training
DIB	Development Impact Bonds
DM	District Magistrate
DNEP	Draft National Education Policy
DSC	District Skilling Committee
DSDP	District Skill Development Plan
DST	Dual System Training
EPFO	Employees Provident Fund Organisation
ERP	Enterprise Resource Planning
ESD	Education for Sustainable Development
ESI	Employees State Insurance
F&B	Food and Beverage
FGL	First Generation Learners
FLDG	First Loss Default Guarantee
FLFP	Female Labour Force Participation
FYP	Five-Year Plan
GoI	Government of India
GP	Gram Panchayat
GPDP	Gram Panchayat Development Plans
IAMR	Institute of Applied Manpower Research
ICT	Information and Communication Technology
IIMB	Indian Institute of Management Bangalore
IIS	Indian Institute of Skills
ILO	International Labour Organization
ITI	Information Technology
ITeS	Information Technology enabled Services
ITI	Industrial Training Institutes
JLG	Joint Liability Group
L&T	Larsen and Toubro
LLB	Legum Baccalaureus (Bachelor of Laws)
LMIS	Labour Market Information System
MBBS	Bachelor of Medicine Bachelor of Surgery
MFI	Micro Finance Institution
MGNF	Mahatma Gandhi National Fellows
MHRD	Ministry of Human Resource Development
MIS	Management Information System
MoE	Ministry of Education
MoLE	Ministry of Labour and Employment
MoPR	Ministry of Panchayati Raj
MoRD	Ministry of Rural Development
MoSPI	Ministry of Statistics and Programme Implementation
MSDE	Ministry of Skill Development and Entrepreneurship
MSME	Micro Small and Medium Enterprises
MVoc	Master of Vocation
OECD	Organisation for Economic Cooperation and Development
NAPS	National Apprenticeship Promotion Scheme
NCERT	National Council Education Research and Training
NCFSE	National Curricular Framework for School Education
NCFTE	National Curricular Framework for Teacher Education
NCIVE	National Council for the Integration of Vocational Education
NCVET	National Council for Vocational Education and Training
NEP	National Education Policy
NEET	Not in Education, Employment or Training
NGO	Non-Government Organization



NHEQF	National Higher Education Qualification Framework
NIF	National Indicator Framework
NILRED	National Institute of Labour Economics Research and Development
NIOS	National Institute of Open Schooling
NITI Aayog	National Institution for Transforming India
NOS	National Occupation Standards
NPE	National Policy on Education
NPS	National Pension Scheme
NPSDE	National Policy on Skill Development and Entrepreneurship
NQR	National Qualifications Register
NRF	National Research Foundation
NSDA	National Skill Development Agency
NSDC	National Skill Development Corporation
NSDF	National Skill Development Fund
NSQC	National Skills Qualification Committee
NSQF	National Skills Qualification Framework
NSRD	National Skills Research Division
NSS	National Sample Survey
NSTI	National Skills Training Institute
NTC	National Trade Certificate
OER	Open Educational Resources
OECD	Organisation for Economic Co-operation and Development
OJT	On-Job-Training
PE	Professional Education
PHC	Primary Healthcare Centre
PLFS	Periodic Labour Force Survey
PMKK	Pradhan Mantri Kaushal Kendra
PMKVY	Prime Minister's Kaushal Vikas Yojana
POA	Programme of Action 1992 of the NPE 1986
PPP	Public Private Partnership
PSSCIVE	Pandit Sunderlal Sharma Central Institute of Vocational Education
PwC	Pricewaterhouse Coopers
PwDs	Persons with Disabilities
QP	Qualification Pack of NOS
QS	Quacquarelli Symmonds
RPL	Recognition of Prior Learning
SANKALP	Skills Acquisition and Knowledge Awareness for Livelihood Promotion
SBI	State Bank of India
SC	Scheduled Caste
SDG	Sustainable Development Goals
SDMS	Skill Development and Management System
SEL	Social and Emotional Learning
SHG	Self Help Group
SHREYAS	Scheme for Higher Education Youth in Apprenticeship and Skills
SIB	Skill India Impact Bond
SIP	Skill India Portal
SMART	Skill Management & Accreditation of Training Centres
SMIS	Skill Management Information System
SOP	Standard Operating Procedure
SSA	Samagra Shiksha Abhiyan
SSC	Sector Skill Council
SSDM	State Skill Development Mission
ST	Scheduled Tribe
STEM	Science Technology Engineering and Mathematics
STRIVE	Skills Strengthening for Industrial Value Enhancement
STT	Short Term Training
SWOT	Strengths Weaknesses Opportunities Threats
TISS	Tata Institute of Social Sciences
TISS-SVE	TISS-School of Vocational Education
TOA	Training of Assessors
TOT	Training of Trainers
TPs	Training Partners
TVET	Technical and Vocational Education and Training
UDISE	Unified District Information System for Education
UGC	University Grants Commission
UN	United Nations
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNEVOC	UNESCO's International Centre for Technical and Vocational Education and Training
UNICEF	United Nations Children's Fund
USD	United States Dollar
VAT	Vocational Aptitude Tests
VE	Vocational Education
VET	Vocational Education and Training
WESO	World Employment and Social Outlook
WBL	Work Based Learning

Definitions

Definitions relating to TVET

TVET

The UNESCO 2015 recommendation concerning technical and vocational education and training defines TVET 'as comprising education, training and skills development relating to a wide range of occupational fields, production, services and livelihoods' (UNESCO, 2016).

TVET is used as a comprehensive term referring to those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences, and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life[1]. TVET connects education to the world of work. It is also a part of lifelong learning.

A formal definition of lifelong learning refers to 'All learning activity undertaken throughout life, with the aim of improving knowledge, skills and/or qualifications for personal, social and/or professional reasons'.

Similarly, a formal definition of skills is 'The relevant knowledge and experience needed to perform a specific task or job and/or the product of education, training and experience which, together with relevant know-how, are the characteristics of technical knowledge'.

TVET, as part of lifelong learning, can take place at secondary, post-secondary and tertiary levels, and include work-based learning and continuing training and professional development, optionally leading to qualifications. It also includes a wide range of skills development opportunities attuned to national and local contexts. Learning to learn and the development of literacy and numeracy skills, transversal skills and citizenship skills are therefore integral components of TVET.

TVET provision in India is often referred to as either 'skilling' or 'skill development'. However, these terms are also widely used in the Indian context to refer to work-related training or vocational training that last for short periods ranging from a few days to a few months. Such 'skilling' or skills training is a part of vocational education but is generally not sufficient to prepare students for long-term engagement with their chosen vocations and set a robust foundation for lifelong learning. Although the words skills and competencies are also sometimes used interchangeably in India, competencies generally refer to not just skills but also the knowledge, attitudes and mindsets, and soft skills associated with various occupations.

Right: The pandemic has highlighted the importance of lifelong learning for all workers, especially those in healthcare who had to undergo rapid upskilling to safely care for COVID patients.

Vocational/ Technical Training

As per the National Sample Survey 75th Round (NSS75, 2019), the main objective of vocational/ technical education and training is to make individuals employable for a broad range of occupations in various industries and other economic sectors. It may be noted that as per Ministry of Education, Technical education generally pertains to higher education while school education up to secondary level is a part of vocational education. There are three methods of acquiring Vocational/ Technical training:

FORMAL TRAINING

Formal training is acquired through institutions/ organizations and is recognized by national certifying bodies, leading to diplomas/ certificates and qualifications. Formal training is structured according to educational arrangements such as curricula, qualifications, teaching/ learning requirements and assessment.

NON-FORMAL TRAINING

Non-formal training is in addition to or alternative to formal learning and is also structured but is more flexible. It is provided through community-based settings, the workplace, or through the activities of civil society organizations or any organization imparting training. This training mode does not have the level of curriculum, syllabus or accreditation and certification associated with formal learning, but is more structured as compared to informal learning.

INFORMAL TRAINING

The training that occurs in daily life, in the family, in the workplace, in communities, and through the interests and activities of individuals. It is not structured (in terms of learning objectives, learning time or learning support) and typically does not lead to certification.

Vocational/technical training other than formal training is acquired in the following ways (NSS75, 2019):

1. **Hereditary**: The expertise in a vocation or trade is sometimes acquired by the succeeding generations from the other members of the households, generally the ancestors. The expertise gained through significant 'hands-on' experience enables the individual to take up activities in either a self-employed capacity or to take up employment.
2. **Self-learning**: is the expertise in a vocation or trade acquired by a person through his/her own effort, without any training under any person or organization.
3. **Learning on the job**: refers to the expertise acquired by a person while in employment (current and/or past), either through informal training by the employer or organization or through the exposure to the type of job that he/she is/was performing. If a person is provided with formal training in a vocation or trade by the employer or organization, while in employment, he/she is considered to have received 'formal' vocational/technical training.
4. **Other**: The 'other' sources include the cases where the expertise for a vocation or trade is developed from household members or ancestors, provided the said vocation or trade is different from the one relating to their ancestors.

[1] https://unevoc.unesco.org/home/TVETipedia+Glossary/lang=en/filt=all/id=474

Sources: https://unevoc.unesco.org/home/TVETipedia+Glossary and definitions used in the 75th Round Survey on Household Social Consumption: Education

Executive summary

GOAL 4

ENSURE INCLUSIVE AND QUALITY EDUCATION FOR ALL AND PROMOTE LIFELONG LEARNING

Education is at the heart of the United Nations 2030 Agenda for Sustainable Development, and is essential to the success of all Sustainable Development Goals (SDGs). The renewed education agenda summarized in Goal 4 and its seven targets – four of which are related to Technical and Vocational Education and Training (TVET) – is inspired by a vision of education that transforms the lives of individuals, communities and societies, leaving no one behind, and is guided by the concept of lifelong learning. India's new National Education Policy (NEP) 2020 embraces the Education 2030 Agenda completely, and commits to greatly expand TVET to enable social justice and livelihoods through quality lifelong learning opportunities for all.

About the report

During the past decade, India has taken giant steps in the provision of TVET. This report describes the extensive infrastructure that has been set up since 2008, and the broad-based capacity for the provision of quality TVET created within the country during this period. It focuses on highlighting progress and achievements, describing the intense on-going activity around TVET provision, and outlining the directions for future growth through the implementation of the new NEP 2020.

Prepared by the Tata Institute of Social Sciences (TISS) and commissioned by UNESCO New Delhi, the report identifies the key lessons learned from the efforts at TVET provision so far, and makes several recommendations for the way forward. Prepared during the pandemic, the report is based on material provided by – and gathered from interviews with – government and private sector functionaries, and specialists in the field. These were backed up with extensive desk research of national and international literature and the websites of key institutions. Given the very large scope of TVET provision across all age groups and various providers, the document focuses mainly on the role of state actors and providers, and to a lesser extent on non-state actors such as private-sector industry and businesses, and non-government organizations (NGOs). Regular interaction with editorial board members and their feedback and suggestions have helped strengthen the report and sharpen the recommendations.

Highlights

The vision for quality TVET at scale

The NEP 2020, notified on 29 July 2020, requires all educational institutions to integrate vocational education into their offerings, thus possibly heralding its explosive growth in the country. A very large number of schools, colleges and universities will join the fold of TVET providers in the coming decade, making TVET available to millions of students while still at school. It will also provide opportunities for more leisurely and holistic training of youth over a number of years, given TVET's integration into the regular school and college curriculum as required by the NEP. The policy also has provisions to bring youth and adults who are in not in education, employment or training (NEET), especially women, back into the fold of TVET through an adult education programme that focuses on literacy as well as livelihoods, and aims to provide certification through the National Institute of Open Schooling (NIOS). This report discusses the challenges educational institutions face in implementing the NEP, and explores ways to fulfil the promise it holds for students.

Current status of TVET provision

The central and the state governments' efforts since 2008 to set up a framework for TVET provision at scale has yielded results, and there is now considerable infrastructure available for offering short-term training courses that

The NEP 2020 heralds the potentially explosive growth of vocational education in the country by bringing all schools, colleges and universities, into the fold of TVET providers.

Above: School students during an exposure visit to the Regional Centre for Biotechnology, a UNESCO Category II institute. Faridabad, Haryana, India.

range between a few weeks and a few months in duration. The main vehicle for provisioning these short-term courses – that are largely paid for by the Government of India (GoI) – has been the National Skill Development Corporation (NSDC), set up in 2008 in a unique public-private partnership. Over time, the NSDC has built up a thriving ecosystem of training partners (TPs) and sector skill councils (SSCs) that have together developed curriculum, delivered training to youth and adults, conducted assessment and provided certification. Data available with the NSDC suggests that over 25 million youth and adults have been trained and certified since inception, and that the capacity for training within this system has now grown to an impressive 5 million annually. Some twenty ministries of the Government of India are conducting training programmes, and according to the Ministry of Skill Development and Entrepreneurship (MSDE), a total of around 10 million people are being trained each year across all ministries. This report reviews the infrastructure for short-term courses and highlights the fact that these courses, by and large, cater only to demand from industry for training and placement of youth in specialized, narrowly defined, entry-level jobs.

10 million people

are being trained each year across all ministries, according to the Ministry of Skill Development and Entrepreneurship.

Longer-term training courses ranging from one to three years are being offered through the Industrial Training Institutes (ITIs) and polytechnics that together have a capacity of over 3 million students. Although many polytechnics existed in the country before independence, and ITIs started soon after independence, their numbers and intake capacity have grown much more slowly relative to the large capacity for short-term courses that has been created in just over a decade.

Secondary schools have also been engaged in the provision of vocational education at the higher secondary level (Grades 11 and 12) since the early 1990s. There are at present around 10,158 state-government-run schools that offer vocational education to over 1.2 million students. This is in addition to approximately 8,583 Central Board of Secondary Education (CBSE) schools that also offer vocational education from Grade 6 upwards. However, the number of students being reached so far is still well below 10% of the cohort in higher secondary school.

At the higher education level, there are more than 1,000 colleges that are presently running the special undergraduate Bachelor of Vocation (BVoc) programmes launched by the University Grants Commission (UGC) in 2013. State governments have also been ramping up their own efforts at TVET provision through their respective State Skill Development Missions (SSDMs). Besides running central government schemes, many states have introduced

There are around 10,158 state-government-run schools that offer vocational education to over 1.2 million students in Grades 11–12 in school. This is in addition to 8,583 CBSE schools.

innovative schemes of their own and are also setting up skill universities. Industry and other non-state actors have also contributed, and overall, there is considerable awareness of the urgency to scale up vocational education.

Challenges of scaling TVET

Going forward, the past decade's successes and failures can help guide TVET provision interventions. The foremost challenge that needs to be overcome is that of the prevalent mindset – among key stakeholders such as students and parents – that TVET is inferior to regular school and college education, and that it is suitable only for those youth who are unable to cope with mainstream education. The provision of vocational education through higher secondary schools during the past decade has not succeeded in overcoming this stigma for several reasons, including the fact that pathways into higher education were not created for these students.

The management of schools and colleges will need to overcome their lack of know-how regarding provision of vocational education, and take on the task of integration with enthusiasm and commitment. Other challenges include the need to provide inclusive access to TVET, especially for women, and the need to overcome the large digital divide. Digitalization of TVET must become a key focus area going forward. There is also the need to create enough opportunities for upskilling, reskilling, and lifelong learning through high-quality courses in new and upcoming areas such as Industry 4.0. Adequate funding for implementation, as well as regulatory support from the central and state governments, will be necessary to ensure that the vision for large-scale growth of quality TVET during the coming decade is realized.

The NEP 2020 also brings the focus back on the learner through its many provisions that move away from the present system of largely rote learning, and towards social and emotional learning (SEL). The latter empowers students to become self-aware, explore their interests, and develop their strengths and capacities towards long-term career growth. This report discusses these and other challenges in detail and makes several recommendations. In particular, the report highlights the need to focus on preserving and promoting India's vast reserves of tangible and intangible cultural heritage, an activity that can create livelihoods for large numbers of its citizens while also instilling a sense of pride and ownership among its youth.

Opposite page: Students learning computer basics in school. Nagpur, Maharashtra, India.

Below: Skilled workers at a block printing unit. Jaipur, Rajasthan, India.

A focus on preserving and promoting India's vast reserves of tangible and intangible cultural heritage can create many jobs and instil a sense of pride among India's youth.

The way forward

The report outlines a set of ten recommendations that could be adopted to help achieve the stated vision for TVET.

RECOMMENDATION 1

Place learners and their aspirations at the centre of vocational education and training programmes.

Vocational aptitude tests coupled with career counselling and guidance are key support measures that need to be made available to all learners. A skills credit bank that is interoperable with the proposed Academic Bank of Credits in the NEP, can help youth accumulate credits towards higher degrees.

RECOMMENDATION 2

Create an appropriate ecosystem for teachers, trainers and assessors.

The induction training of trainers and assessors, their terms of recruitment and deployment, working conditions and career prospects, must all be given due attention so that these become attractive and aspirational professions. Teachers in schools must also be supported in a similar way.

RECOMMENDATION 3

Focus on upskilling, reskilling and lifelong learning.

The considerable infrastructure for short-term training courses that has been created by the NSDC and its partners needs to be re-oriented, away from providing training for entry-level jobs and towards high-value paid courses in new and strategic areas such as Industry 4.0, and greening TVET.

RECOMMENDATION 4

Ensure inclusive access to TVET for women, persons with disabilities, and other disadvantaged learners.

The Recognition of Prior Learning (RPL) mechanism of counselling, orienting, and certifying workers in the informal sector holds great promise for improving their livelihoods, and must be implemented more locally, at the Gram Panchayat level, for their convenience.

RECOMMENDATION 5

Massively expand the digitalization of vocational education and training.

Given that digital skills are driving competitiveness in today's economy, digitally supported education

Above: Youth receiving practical skilling as part of Automotive Technician training supported by AIF's Market Aligned Skills Training (MAST) programme. Gurgaon, Haryana, India.

and training can make learning more flexible, help strengthen individual skills and competencies, and enhance the quality and attractiveness of TVET.

RECOMMENDATION 6

Support local communities in generating livelihoods by capitalizing on India's cultural heritage.

India's vast reserves of tangible and intangible cultural heritage include several UNESCO World Heritage sites and a wide variety of arts and crafts. Their preservation and promotion can support many more jobs than they do at present, and require a multi-pronged approach towards building an adequately trained workforce.

RECOMMENDATION 7

Align better with the 2030 Agenda for Sustainable Development.

The 2030 Agenda for Sustainable Development provides a comprehensive framework for the creation of new and relevant TVET programmes in many areas of strategic importance to India such as water management and sanitation, clean energy, climate change and sustainability, among many others.

RECOMMENDATION 8

Deploy innovative models of financing TVET.

Innovative financing models such as development impact bonds, skill vouchers etc. can strengthen many aspects of the value chain of TVET provision including the creation of shared infrastructure, supporting socially and economically disadvantaged groups and more.

RECOMMENDATION 9

Expand evidence-based research for better planning and monitoring.

High-quality research based on careful data-gathering and analytics can add value to all aspects of TVET planning and delivery, including tracking student life cycles across skilling, upskilling and reskilling, and aiding policy formulation based on assessment of outcomes.

RECOMMENDATION 10

Establish a robust coordinating mechanism for inter-ministerial cooperation.

For instance, educational institutions affiliated to the Ministry of Education (MoE) can better deliver on their mandate from the NEP if they are able to collaborate with institutions of the Ministry of Skill Development and Entrepreneurship (MSDE) and other ministries in order to leverage the available expertise and infrastructure.

UPSKILLING INDIA

Pradhan Mantri Kaushal Vikas Yojana (PMKVY) trainees undergoing sewing machine operator training at Learnet Skills. Okhla, New Delhi, India.

CHAPTER 1

About the Report

This chapter describes the scope and structure of the report, and explains the methodology used to prepare this comprehensive document on the state of technical and vocational education and training in India.

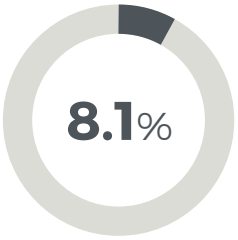
1 About the report

TVET provision in the context of the COVID-19 Pandemic

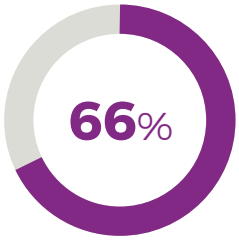
The COVID-19 pandemic has transformed the context of this report, taking it beyond the elucidation of the vision, mission, and activity around the provision of TVET in India. It has drawn attention to the much greater role that TVET can play at this time, to assist communities that have been economically and socially impacted by the pandemic and its fallout. TVET provision itself has also been hit very hard by the pandemic, with millions of students the world over unable to attend classes, access laboratories, and avail internships or apprenticeships during the lockdown. The response to the pandemic, by both state and non-state actors, have been covered in the report.

Even at the best of times, a high-quality, high-throughput TVET system was a pressing need for India, both to meet the need for skilled manpower for the economy and to achieve the aim of inclusive and equitable growth. Given that India has a very young population – with 25.9% below the age of 14, only 8.1% above the age of 60, and as many as 66% in the working age group of 15–59 in 2018 – quality education, jobs, training, and support for entrepreneurship, are all pressing requirements (Sample Registration System Statistical Report [SRS], 2018). While developed countries typically have well over 50% of their working-age population formally trained in TVET, India's numbers remain in single digits, at just 2.74% (Periodic Labour Force Survey [PLFS], 2020).

of India's population is below the age of 14



of India's population is above the age of 60



is in the working age population (15-59 years)

Above: Training for health workers gained momentum during the COVID-19 pandemic. Guwahati, Assam, India.

Opposite page: Youth receive training as Geriatric Care Aides (GCA) at AIF's GCA Training Center. Noida, Uttar Pradesh, India.

COVID-19 and its impact

Economies the world over have been severely hit by the lockdowns necessitated by the COVID-19 pandemic, and unemployment is rampant. In developing countries such as India, where there are no social safety nets for a large majority of the people and millions are out of work, the pandemic has re-focused attention on the extreme inequalities in income and opportunities that have grown unchecked, and will need to be addressed and even reversed to the extent possible. The most enduring images of India's COVID-19 response have been that of millions of workers trying to walk home post the lockdown, despite incredible odds. State governments that have been receiving the returning workers are attempting to map their skills and either providing them with alternate employment or reskilling them for new ones. TVET is therefore a critical part of the response to the pandemic. Given that many workers are unlikely to return to the cities anytime soon, the inevitable shortage of skilled manpower in metros, cities, and towns across many different sectors of the economy will also need to be addressed. Some of the workers have inadvertently carried the virus with them to their villages and hamlets, creating the need for COVID-19-related healthcare in far-flung areas of the country. This can also be addressed in large part through TVET that can be used to train and/or re-orient healthcare workers to the needs of COVID-19 patients.

For most citizens of India, particularly those who have had the good fortune to be spared the loss of jobs and livelihoods, the protracted stay at home with families have resulted in greater awareness of the value of digitalization of education and of TVET systems, and the rediscovery of simple pleasures within a slower pace of life. The consequent steep reduction in the consumption of resources is also causing a welcome rethink regarding lifestyles going forward. The impact of the lockdown on improving air quality everywhere, on cleaning up some of the important rivers in the country such as the Ganga and the Yamuna, and the return of birds in large numbers to the cities, have only underlined the need to refocus on 'greening', not just of our lifestyles but also of the economy. A significant shift towards a more digital, sustainable and equitable society with better work-life balance appears to be possible, provided we are willing to seize the opportunity.

Scope of the report

The report documents the state of education in India in 2020 with regard to the provision of TVET. Despite the fact that there are over 20 ministries of the Government of India that are engaged in TVET, we focus largely on the work being done by the Ministry of Skill Development and Entrepreneurship (MSDE) – set up for the purpose in 2014 – its key institution the National Skill Development Corporation (NSDC), and also the Ministry of Education (MoE) that will play a key role in the growth of TVET.

The scope for TVET provision in the country is very large given the need to supply trained personnel to all sectors of the economy. This report provides an overview of the present capacity for TVET provision through short-term and long-term courses run by state as well as non-state actors, including educational institutions. It discusses the two previous education policies, and considers in detail the approach to TVET provision reflected in the new NEP 2020 in light of the country's priorities – some of which follow from the 2030 Agenda for Sustainable Development of the United Nations (UN). The report reviews the progress made so far against targets, highlights the challenges that remain to be addressed, and details the work that needs to be done going forward. Lastly, it presents ten key recommendations for the Indian government's consideration.

Given that the report has been prepared during the pandemic, the actions of the central and state governments and their component/partner agencies and institutions in response to the pandemic have also been highlighted. The report makes important recommendations for reform, keeping in mind the fact that a post-COVID world must rethink and re-imagine the lives of its citizens, particularly youth and women, and use TVET to empower them to adapt to the post-COVID world.

Although a broad definition of TVET would include education in engineering, law and other disciplines at the undergraduate level, these are not discussed here. They constitute a very large sector in the Indian education system that is separate and largely insular.

The report makes important recommendations for reforms and for the use of TVET to empower youth to adapt to the post-COVID world.

Methodology

The report has been put together using material gathered from multiple primary and secondary data sources. Given that the pandemic set in just before the data gathering phase of the research could begin, many in-person visits to the sites of TVET provision and the conversations with stakeholders that had been planned had to be abandoned. Primary information gathering has therefore been done online via audio/video calls supplemented with exchanges of emails and documents. Despite this, it has been possible to develop a keen understanding of the situation on the ground, including the challenges. Primary data has been gathered in the following ways:

- Documents, reports and information – not all of which are in the public domain – provided by functionaries of government ministries/departments, other TVET institutions such as the NSDC, and certain sector skill councils (SSCs), training partners, NGOs and educational institutions.
- Online (audiovisual) and offline (email) conversations with select experts in the field and Editorial Board members, more than once in some cases. These conversations cannot unfortunately be referenced, but they have contributed greatly to our understanding of the landscape and also of specific issues.
- Information gathered from well-known experts and thought leaders in TVET who were speaking at webinars discussing the fallout of the pandemic, its impact on the economy and society, as well as on TVET providers and learners.
- Case studies compiled via conversations with experts from the concerned educational institutions and civil society organizations, both national and international. Some of the important ones are showcased in this report.

Considerable secondary data has also been gathered and analysed from published literature:

- Academic literature, including publications in peer-reviewed journals.

Above: Hairstylist from India competing. WorldSkills Competition 2019, Russia.

- Research reports by national and international agencies, both public and private.
- Policy documents, both national and international.
- Official reports of the central and state governments, and material on their websites.

The inability to interact physically with several key stakeholders has, however, been a severe limitation. For instance, it was difficult to identify and learn about some of the innovative initiatives that may be under way in various states, so only a few are featured here. Many government websites are also not updated regularly, and the documents available are often not dated which makes them unusable.

Some of the case studies featured in the report were known to the authors previously, and the information presented here was gathered on visits to those organizations prior to the onset of the pandemic. Given the vastness of the TVET landscape, the material presented here is a partial selection centred around the release of the NEP 2020, with the intent of exploring its potential to help grow TVET through educational institutions.

Structure of the report

The report consists of 7 chapters. The introduction (Chapter 2) sets the context for TVET provision in India and also discusses the impact of the COVID-19 pandemic. Chapter 3 covers the national and international policy perspectives on TVET provision, including discussions on the National Policy on Skill Development and Entrepreneurship (NPSDE), the NEP 2020, and the 2030 Agenda for Sustainable Development. Chapter 4 describes the stakeholders engaged in TVET provision, their roles and responsibilities, and also some of the major schemes that are currently under way. The list of stakeholders includes ministries of the Government of India, state governments, some key institutions such as the NSDC, its training partners, the SSCs, and the ITIs and polytechnics that, between them, run short-term as well as long-term programmes. A World Bank supported programme, SANKALP, that aims to strengthen the ecosystem for TVET provision, is also discussed here.

TVET provision in India has not grown as fast as it needs to, given the considerable unmet need in India's growing economy. Chapter 5 captures all the challenges involved in the growth of TVET from the perspective of students, parents, employers, providers, and of society. The careful discussion of the lessons of the previous decade also sets the stage for the two subsequent chapters. Chapter 6, 'The Way Forward,' analyzes the causes underlying the concerns highlighted in the previous chapter and suggests solutions as well as directions for reform. The final chapter captures ten recommendations in more detail, listing action items corresponding to each one of them. Given that this report discusses the contributions of the key players engaged in TVET provision, it can be used as a starting point for further research and dialogue on the subject.

EMPOWERING WOMEN

Defying stereotypes, women welders undergo hands on training. Nagpur, Maharashtra, India.

CHAPTER 2

Introduction

Technical and Vocational Education and Training (TVET) is concerned with the acquisition of knowledge and skills for the world of work. This chapter sets the context for the enormous progress that has been made in the past decade with regard to TVET provision in India.

2 Introduction

Scope of TVET

> “Technical and vocational education and training’ (TVET) is understood as comprising education, training and skills development relating to a wide range of occupational fields, production, services and livelihoods.”
>
> **UNESCO, 2016**

One of the broad definitions of TVET, adopted by UNESCO is as follows:

It is used as a comprehensive term referring to those aspects of the educational process that involve – in addition to general education – the study of technologies and related sciences, and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life[1]. TVET also refers to deliberate interventions to bring about learning that would make students adequately productive in designated areas of economic activity. Although ‘work productivity’ is not the only aim and concern of TVET, it is its distinctive objective, and this sets it apart from other forms of education and training.

TVET provision must also be distinguished from ‘skilling’ or ‘skill development’, terms that are widely used in the Indian context to also refer to work-related training or vocational/practical training for tasks or occupations that last for short periods ranging from a few days to a few months. Although the words skills and competencies are often used interchangeably, competencies generally refer to not just skills but also knowledge, attitudes, mindsets, and soft skills associated with various occupations. Having built up a strong infrastructure for the provision of skills through vocational training, India is now beginning to focus more on enabling students/youth to develop competencies. The term vocational education is used most often to refer to the acquisition of competencies in various occupations along with a more broad-based general education that is necessary for taking on a fast-changing world of work. It represents a more comprehensive preparation of youth and is best done through educational institutions as part of the implementation of the National Education Policy (NEP) 2020.

[1] https://unevoc.unesco.org/home/TVETipedia+Glossary/lang=en/filt=all/id=474

Right: A competitor from India creates a jacket as part of the final module in Fashion Technology Skill category. WorldSkills 2019, Russia.

Opposite page: Young student honing her photography skills. Career opportunities and training provision for creative industries is gaining momentum. Uttar Pradesh, India.

Thus, skilling or skills training is a part of vocational education but is not sufficient to prepare students for long-term engagement with their chosen vocations and set a foundation for lifelong learning. In the rest of this chapter we will use the term TVET interchangeably with vocational education, and also with vocational training or skilling, always keeping the broadest definition in mind, and relying on the context to make the specific use of the term apparent.
(See Page 7 for more definitions.)

The following sections will first set the context for TVET provision in the country today, then touch upon the impact of the pandemic along with some ongoing initiatives for coping with it. Ideas for TVET provision in a post COVID-19 scenario are outlined in the final section.

Undergraduate education in agriculture and allied disciplines; legal education; medical education and all related disciplines of healthcare; technical education covering diverse disciplines such as engineering, architecture, management and pharmacy; and even teacher education are a part of this broad definition of TVET. However, as mentioned earlier, given that these undergraduate degrees (BE, BTech, MBBS, LLB etc.), are all extremely aspirational in nature and are delivered through separate standalone colleges and universities in India, this report will not address them.

TVET provision in India: A nation in transition

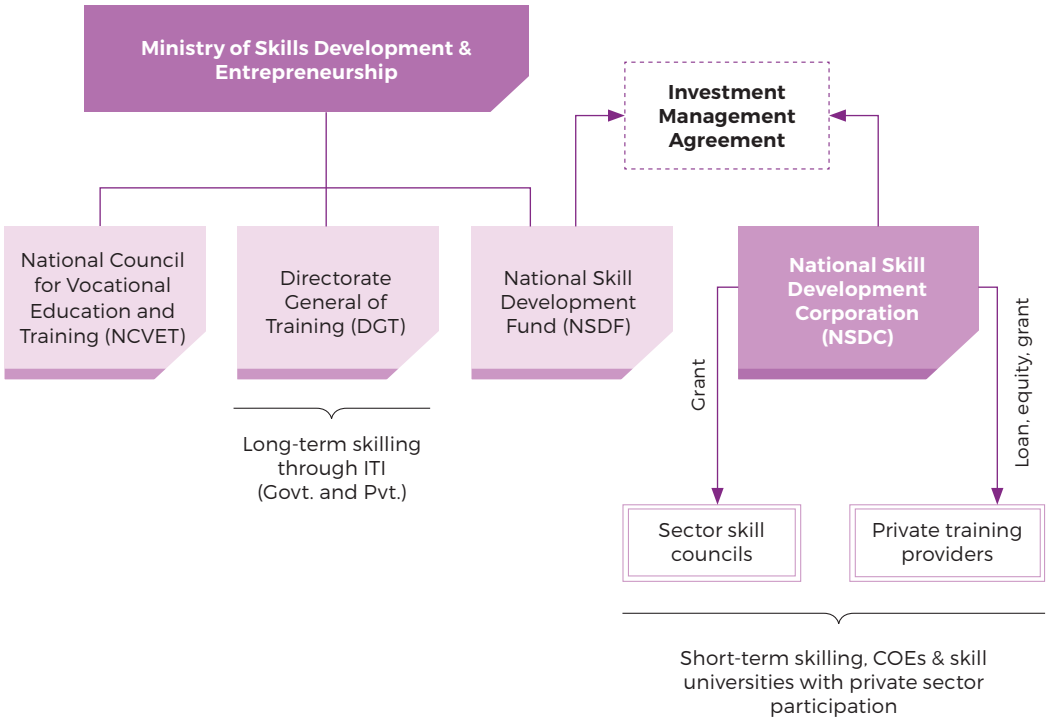
India is at an exciting stage today, having made considerable progress towards its goal of creating a skilled workforce of 110 million by 2022 as stated in the National Policy of Skill Development and Entrepreneurship (NPSDE) released in 2015 (NPSDE, 2015). It is presently training 10 million[2] youth annually through its many ongoing schemes. The concerted efforts made during the past decade began with initiatives launched during the implementation of the Eleventh Five-Year Plan between 2007 and 2012 (FYP, 2015). The National Skills Development Corporation (NSDC) was set up in 2008 as a public-private partnership, and the first National Skill Development Policy announced in 2009. The sector skill councils (SSCs) were set up by the NSDC to assist industry by streamlining the process of skills-gap analysis, training and assessment. The National Skills Qualifications Framework (NSQF) was adopted in 2013 (NSQF, 2013).

A separate ministry of the Government of India, the Ministry of Skill Development and Entrepreneurship (MSDE), was notified in November 2014 to speed up efforts at TVET provision. The NSDC was brought under it in 2015, giving the process a renewed momentum. Besides MSDE, over 20 ministries of the government, along with many non-state actors, are presently engaged in providing vocational training. MSDE is tasked with coordinating between them (MSDE, 2019). Many projects and schemes that have been run, especially during the last five years, have provided valuable experience and insights regarding what works and what does not, and some of these learnings, including the challenges identified, are discussed in Chapter 5.

[2] https://pib.gov.in/PressReleasePage.aspx?PRID=1596916

FIGURE 1
Institutional mechanism for TVET through MSDE

New ministry notified on Nov 10, 2014



Source: NSDC

> To create an ecosystem of empowerment by skilling on a large scale at speed with high standards and to promote a culture of innovation based entrepreneurship which can generate wealth and employment so as to ensure sustainable livelihoods for all citizens in the country.
>
> **The Vision Statement for TVET in India**

The Vision Statement in the NPSDE, reiterated by the MSDE (MSDE, 2019). has been 'To create an ecosystem of empowerment by skilling on a large scale at speed with high standards and to promote a culture of innovation based entrepreneurship which can generate wealth and employment so as to ensure sustainable livelihoods for all citizens in the country.'

A considerable amount of capacity has now been built among all stakeholders at the front line of TVET provision, and the value of TVET is well understood and appreciated by many, if not all, of them. Through the efforts of the MSDE; the NSDC and its training partners (TPs); the SSCs; and the new National Council for Vocational Education and Training (NCVET) – notified in November 2019 to regulate the entire ecosystem – the infrastructure for the provision of short-term training courses is now stabilizing (see Figure 1). These institutions have overcome some of the initial hurdles they faced in delineating and discharging their respective roles and responsibilities and are now ready to scale. End-to-end infrastructure for providing short-term vocational training is therefore now available, targeted at youth who fall under the 'not in education, employment or training' (NEET) segment, are self-employed, or work in the informal sector, enabling them to receive training and move towards better incomes.

The NPSDE also provided an impetus to the provision of vocational education through school and higher education, by requiring that the former is introduced by 25% of all schools and colleges. More recently, a systematic effort to integrate vocational education at scale across schools in the states has been worked out with the support of NSDC, the SSCs, and the Ministry of Education (MoE). The curriculum for the vocational education courses that are part of this 'Samagra Shiksha Abhiyan' (Samagra, 2019) have been prepared by the Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE), covering 55 job roles in 19 sectors of the economy. As of 2019/20, these courses are being offered at 10,158 schools in the states, touching the lives of over 1.2 million students. A detailed state-wise breakup of these schools is available in Table 1. In addition, approximately 8,583 CBSE schools run by the Central government are also offering vocational courses prepared by PSSCIVE. There is some overlap between these two sets of numbers, because government schools in Arunachal Pradesh, Sikkim, Delhi, Chandigarh, and Andaman & Nicobar Islands, being affiliated to the CBSE, are counted in both lists.

TABLE 1

List of state-government-run schools offering vocationalization of secondary school education

Serial Number	State	Number of schools approved	Number of schools implemented	Total enrolment
1	A&N	37	37	5983
2	Andhra Pradesh	437	437	48823
3	Arunachal Pradesh	101	99	14349
4	Assam	340	269	27183
5	Bihar	38	0	0
6	Chandigarh	22	22	3019
7	Chhattisgarh	546	546	98581
8	DNH	4	4	318
9	Daman & Diu	5	5	325
10	Delhi	65	65	4967
11	Goa	132	120	7190
12	Gujarat	122	120	5557
13	Haryana	1065	1065	129345
14	Himachal Pradesh	953	873	84100
15	Jammu & Kashmir	657	572	37624
16	Jharkhand	388	260	26941
17	Karnataka	150	150	12392
18	Kerala	93	93	10284
19	Lakshadweep	5	0	0
20	Madhya Pradesh	1200	1141	140384
21	Maharashtra	644	509	50877
22	Manipur	78	62	7126
23	Meghalaya	25	23	1526
24	Mizoram	29	27	3332
25	Nagaland	26	18	2295
26	Odisha	576	576	56692
27	Puducherry	9	9	526
28	Punjab	955	955	111300
29	Rajasthan	905	905	126969
30	Sikkim	194	184	21182
31	Tamil Nadu	120	120	15791
32	Telangana	307	192	51966
33	Tripura	80	24	920
34	Uttar Pradesh	200	0	0
35	Uttarakhand	200	0	0
36	West Bengal	726	676	94029
	Total	**11434**	**10158**	**1201896**

Source: Ministry of Education

Over 280,000 secondary schools, nearly 40,000 colleges and more than 1,000 universities can potentially come into the fold of TVET providers as a result of the NEP 2020.

Above: College students attend a practical, laboratory session. Yavatmal, Maharashtra, India.

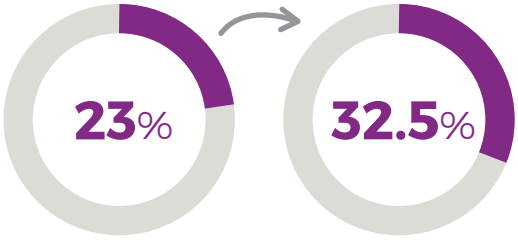
Given that an undergraduate (Bachelor's) degree is aspirational in India, the BVoc courses introduced by the University Grants Commission (UGC) in 2013 have begun to see much faster uptake after some initial hiccups (UGC, 2013). Similarly, various models of embedding vocational education and training – or simply courses related to employability and life skills – into regular BA/BCom/BSc courses are being attempted, given that as much as 63% of the enrolment in higher education institutions in the country is in just these three courses (All India Survey on Higher Education [AISHE], 2019). Employability data from the India Skills Report (ISR) 2020 indicates that graduates from BA and BCom programmes have 48% and 47% employability respectively, while BSc programmes are worse off at just 34%[3] (ISR, 2020).

The new NEP 2020 and its precursor, the more detailed Draft National Education Policy (DNEP) 2019, creates the environment for these efforts to take flight and achieve scale (DNEP, 2019). The NEP 2020 envisions that all schools and colleges will integrate vocational education into their offerings, as opposed to just 25% as required by NPSDE 2015. They must begin with providing exposure to different vocations from Grade 6 onwards, offer vocational education courses at NSQF levels 1–4 during secondary school, and progress towards NSQF levels 5 and beyond in higher education. With such a move, the NEP 2020 sends out the strong message that a transition is being made – from the provision of TVET for just a few students to the provision of TVET for every child – which is a critical step forward, not just in proliferating TVET but also in making it more acceptable in the country. As a result of this step, over 280,000 secondary schools (Unified District Information System for Education [UDISE], 2018/19), nearly 40,000 colleges, and more than 1,000 universities (AISHE, 2019) can potentially come into the fold of TVET providers. Given the large number of candidate institutions, this will put the integration of vocational education into school and higher education at the centre of all future plans for TVET provision. In turn, this will help ensure that youth receive the holistic education that they need, including the theoretical knowledge and the practical skills and competencies that are necessary for taking on the fast-changing world of work.

[3] This is a reversal of the trend from just the previous year, India Skills Report, 2019, in which BSc graduates were considered more employable than BA and BCom graduates, and must therefore be studied more carefully in the coming years.

The impact of the pandemic

Even before the pandemic hit, there was an unmet need for trained manpower in various sectors of the Indian economy. The need for large-scale TVET provision was also well recognized, due to the last several decades of jobless growth of the economy. The tremendous impact of the pandemic – on TVET provision itself and in the form of massive job losses, particularly among youth, and the large-scale movement of workers – has only made the need to re-orient TVET towards upskilling, reskilling and lifelong learning more urgent. Although it is hard to predict all the changes that the pandemic is likely to bring in the coming months and years, it is certain that TVET will play a critical role in helping to shape the new post-pandemic world.



youth unemployment in India in 2019

youth unemployment likely in 2020

The ongoing lockdown in many countries has interrupted learning not just in classrooms but also in workplaces, impacting apprenticeships and other work-based learning, the assessment of skills, and the award of qualifications. Some recent reports by the International Labour Organization (ILO), Organisation for Economic Cooperation and Development (OECD), UNESCO and the World Bank (WB) show that TVET has been uniquely impacted by the pandemic. This is not only due to the digital divide and the difficulties in provisioning education and training in the context of physical distancing norms and travel restrictions, but also because countries are being forced to anticipate and adapt to likely significant changes in the labour market in the coming months (ILO–UNESCO–WBG, 2020). (OECD, 2020).

These observations have been corroborated by another joint report on the youth employment crisis in Asia and the Pacific by the ILO and the Asian Development Bank (ADB). The report estimates that between 4.1 million and 6.1 million youth in India may have lost, or are likely to lose, their jobs in 2020 (ILO–ADB, 2020). The estimate range is based on the length of time considered for containing the virus as either three or six months. Given that in India the virus has not yet been contained, these numbers could get worse.

Two-thirds of firm-level apprenticeships and three-quarters of internships have completely disappeared for a variety of reasons, including infrastructure issues and limited digital literacy among Indian youth. Youth unemployment in India may go up from just over 23% in 2019 to as much as 32.5% in 2020, depending on the time taken for containment. Seven sectors are expected to contribute up to 70% of youth job losses, of which agriculture and construction are the most dominant. The report suggests the following support measures for youth, several of which are related to TVET.

- Provide youth-targeted wage subsidies and public employment programmes.
- Expand job information and employment services targeted to young jobseekers.
- Support apprenticeship programmes and focus on demand-driven skills development.
- Increase funds for upskilling and reskilling, especially in growth sectors.
- Invest in digital inclusion for equitable access to education, training and entrepreneurship.
- Support young entrepreneurs through access to capital combined with non-financial services.

Women as a group are disproportionately impacted by the pandemic. An ILO monitoring report[4] titled 'COVID-19 and the world of work' from June 2020, analyses in detail how the pandemic deepens existing disparities, threatening to eliminate the modest gains achieved in recent years in terms of gender equality in the labour market the world over. Some reasons for this are listed below.

- Some of the hardest hit sectors of the economy such as construction, retail and food services among others, accommodate the largest number of women.
- Female-dominated sectors such as arts and entertainment, domestic work and other services that have been most heavily impacted by pandemic-related lockdowns account for as much as 61% of female workers.
- Globally, an overwhelming number of workers – as much as 70% – in the healthcare and social sectors are women.
- Increased demand for care affects women disproportionately. Even in normal times, women absorb three-quarters of all unpaid care work, which has now increased due to school closures and other responsibilities at home. The documented increase in domestic violence has added to their difficulties.

Before the pandemic, the international community had already committed to

[4] https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/briefingnote/wcms_749399.pdf

far-reaching, transformative changes to the global development processes, and to the world of work, by adopting[5] the United Nations 2030 Agenda for Sustainable Development (UN, 2015) and the ILO Centenary Declaration for the Future of Work (ILO, 2019). The pandemic will create higher levels of unemployment, inequality, poverty, and debt. This makes it important for governments to 'build back better'. In this regard, the human-centred agenda for the future of work set out by ILO Centenary Declaration involving investment in people's capabilities, the institutions of work, and the sustainable jobs of the future, provide important reference points for tackling the key challenges that lie ahead.

What exactly the new normal will be, and what changes it will bring to the economy and to society is not yet clear given that we are still very much in the middle of the pandemic, despite the passage of over six months. In fact, it has become apparent that for many people from the most vulnerable groups, the impact of the pandemic will last much longer, perhaps 24 months or more, well beyond the discovery and administration of a vaccine to every citizen. If the weaknesses in the planning and delivery of TVET highlighted by the pandemic could be addressed during this period, then a better, more inclusive, system for TVET provision could be created to help bring succour to some of the most vulnerable groups.

Reorienting TVET provision towards the post-COVID scenario

The pandemic has underscored the important weaknesses in our preparedness, namely the lack of investment in healthcare and education including infrastructure, the stark digital divide that has remained neglected for many years, the lack of low-cost housing that is at the root of the difficulties faced by migrants, the neglect of inclusiveness in the provision of TVET, the lack of decent livelihoods for women and persons with disabilities (PwDs), and more. It has also created an opportunity for India to rebuild its TVET systems better and stronger and move towards better outcomes, taking cues from the responses necessitated by the pandemic.

As mentioned earlier, youth unemployment was high in the country even before the pandemic, given that India's economy has been seeing jobless growth for many years, including the period when GDP growth rates were at their highest (Maira, 2014). Several steps must therefore be taken to mitigate the persistent high levels of unemployment that is likely to continue for some time. Youth need to be provided with upskilling and reskilling opportunities that are focused on self-employment and entrepreneurship. These opportunities need to be created in future-proof disciplines associated with Industry 4.0, greening and sustainability. Care needs to be taken to ensure that youth are provided education and training opportunities in environments that are focused on Social and Emotional Learning (SEL), so that they can develop the necessary resilience to rebound from the setbacks they have suffered during the pandemic.

The digital divide arising out of social inequalities and the lack of investment in digital infrastructure at educational and training institutions, needs to be corrected at the earliest. Else, many technological advances and opportunities in Industry 4.0 such as the Internet of things, machine learning, robotics, artificial intelligence, bionics, blockchain technologies, augmented/virtual reality and other up-and-coming areas will continue to remain inaccessible to large numbers of youth and adults. Given that these areas also represent opportunities for more robust jobs that pay better and are likely to remain in demand nationally and internationally, it becomes all the more critical to bridge the digital divide. It will also be worthwhile to explore options for innovative digital pedagogical approaches such as the use of simulators, augmented/virtual reality, and artificial intelligence for adaptive and personalized learning. Although technological advances create requirements for new skills to meet the needs of the new economy, they also bring with them the risk of job losses. For instance, different types of medium-skilled jobs can be at risk from automation. On the other hand, the rise in wages of occupations associated with these new technologies will be a powerful attractor for youth and will help to overcome another problem with TVET in India, namely low enrolment. The NEP 2020, discussed in the following section, has also made several provisions towards addressing the issue of low enrolment.

As is well known, TVET can contribute towards empowering individuals, and promoting a sustainable and inclusive economy, social inclusion and environmental sustainability. Planning for future TVET provision must keep all these aspects in mind and must also be based on projections regarding changing labour markets. Specific recommendations regarding the provision of TVET are discussed in Chapters 6 and 7.

Opposite page: Lady driver and owner of 'Pink Cab', a scheme launched with the aim of providing a safe commute option for women (driven) by women, backed by a subsidy from the state government and driver training from partner NGOs. West Bengal, India.

[5] https://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E

Summary

India is at an exciting stage today with regard to the provision of Technical and Vocational Education and Training (TVET), having successfully created a considerable amount of capacity through the efforts of the Ministry of Skill Development and Entrepreneurship, the National Skill Development Corporation and its training partners, and the sector skill councils. The value of TVET in providing decent work and livelihoods is well understood by key stakeholders and the entire ecosystem to now poised to scale.

A systematic effort to integrate vocational education across secondary schools and colleges within the country is under way with over 18,000 schools and 1,000 colleges already engaged, and many useful lessons have been learnt. The National Policy on Skill Development and Entrepreneurship 2015 had envisioned that 25% of schools and colleges would introduce vocational education, but the new National Education Policy (NEP) 2020 goes much further by requiring ALL schools and colleges to do so.

With such a move, the NEP 2020 has sent out the strong message that a transition is being made from the provision of TVET for just a few students to the provision of TVET for every child, which is a crucial step forward, not just in proliferating TVET but also in making it more acceptable within the country. As a result, over 280,000 secondary schools, nearly 40,000 colleges, and over 1,000 universities can potentially become TVET providers.

The impact of the COVID-19 pandemic has been particularly severe on youth. Two-thirds of firm-level apprenticeships and three-quarters of internships have completely disappeared for a variety of reasons. Youth unemployment in India is likely to increase sharply, from just over 23% in 2019 to as much as 32.5% in 2020, depending on the time taken to contain the pandemic.

Women as a group have been disproportionately impacted by the pandemic. Some of the hardest hit sectors of the economy such as construction, retail and food services, accommodate the largest number of women. Over 70% of healthcare and social service workers are women, and the increased demand for care overall affects them disproportionately.

Before the pandemic, the international community had already committed to far-reaching, transformative changes to the global development processes and to the world of work by adopting the United Nations 2030 Agenda for Sustainable Development. Youth need to be provided with upskilling and reskilling opportunities in future-proof disciplines associated with Industry 4.0, greening and sustainability among others. This needs to be done in environments that are focused on Social and Emotional Learning (SEL), so that youth can develop the necessary resilience to rebound from the setbacks they have faced during the pandemic.

TVET & SUSTAINABILITY

Solar panel installation and maintenance training in progress. Green jobs benefit both the economy and the environment. Bhubaneswar, Odisha, India.

CHAPTER 3

The policy perspective of TVET provision

This chapter examines the policy perspective of the development of TVET in post-independence India, based on national priorities expressed through various policy documents.
It also discusses international priorities as reflected in the UN's 2030 Agenda for Sustainable Development and the global TVET strategy of UNESCO.

3 The policy perspective of TVET provision

National policies and the growth of TVET

At the time of independence, technical education in the country was available through 38 engineering colleges – with an intake capacity of nearly 3,000 students – that offered degree courses, and 53 polytechnics – with an intake capacity of 3,700 students – that offered diplomas. After independence, in 1949, the University Education Commission headed by Dr S. Radhakrishnan emphasized in its report the need for new types of engineering and technical institutes in India (Radhakrishnan, 1949). It also advocated closer liaising between engineering and technical colleges, and universities offering education in other disciplines. The focus of governments in the early years was on technical education for students completing Grade 10 in school, overseen by the All India Council for Technical Education (AICTE), and on education for school dropouts. The Ministry of Labour and Employment (MoLE) initiated the Craftsmen Training Scheme (CTS) for students passing out of Grade 8, as early as in 1950.

After independence, the number of polytechnics in India grew quickly, to 284 by 1966, with an intake capacity of about 49,000. The first National Policy on Education 1968 (NPE, 1968) had stated that practical industry training should be an integral part of technical education and a free two-way flow of personnel between industry and education should be encouraged to allow continuous cooperation in the provision, design and periodic review of technical education and facilities. This did not happen in reality. Soon, education at the polytechnics became very theoretical, and unemployment among diploma holders rampant. The Damodaran committee, set up to review the matter, studied all aspects of technical education and suggested several reforms. These included quality improvement programmes, autonomy of state boards, examination reforms, sandwich courses – under which students would alternate between educational institutions and industry for specified periods (to produce the type of technicians that met industry needs) – and entrepreneurship programmes (Damodaran,

Opposite page: Training in progress at Learnet Skills using a welding simulator that allows students to learn basics without risk or cost. Okhla, New Delhi, India.

Below: Students at an auto body repair workshop set up with industry support to enhance practical training. Pusa Industrial Training Institute, New Delhi, India.

The PM's National Council on Skill Development, as well as the NSDC, were set up in 2008 as part of a 'Coordinated Effort on Skill Development' approved by the Cabinet (PM–NCSD, 2008).

1971). However, these reforms too were only partially implemented. This was perhaps because education was then the responsibility of state governments according to the Indian Constitution, and several states did not agree to follow these recommendations.

In 1976, the Forty-second Amendment of the Constitution of India brought education under the concurrent list, making it a joint responsibility of both central and state governments. A 'vocationalization' programme for including vocational education at higher secondary levels was initiated the same year, on the basis of a report created by the National Council of Educational Research and Training (NCERT). It was implemented in ten states and five union territories. The Programme of Action (POA) 1992, the implementation plan for India's second National Policy on Education (NPE 1986), assessed that the intake in the vocational stream at the time was about 72,000 students, and that only about 2.5% of the student cohort entering the higher secondary level were receiving vocational education (POA, 1992). It went on to identify many factors responsible for the slow progress. These included the absence of a well-coordinated management system, unemployability of students completing the vocational courses, demand and supply mismatches, lack of widespread acceptance of vocationalization as a concept, absence of proper provisions for professional growth and career advancement etc. These factors are of concern even today.

Drawing from the careful and detailed observations of the report of the Kothari Commission (Kothari, 1966), the country's first education policy (NPE 1968) had already mentioned the need to maintain a proper balance between the output of educational institutions and employment opportunities. The report envisaged that 50% of higher secondary students and 20% of secondary school students would take up vocational education. These numbers are yet to be achieved.

The POA 1992 laid out detailed plans for achieving the more modest goals set out in NPE 1986 – of covering 10% of higher secondary students by 1995, and 25% by 2000. These included the setting up of the Central Institute of Vocational Education (CIVE, now known as the PSSCIVE) as a constituent unit of the NCERT. Out of the other institutions set up at the time – such as the central Joint Council for Vocational Education, the state councils for vocational education, and the district coordination committees – several have wound up. The POA 1992 observed that nationally, vocationalization at the higher secondary level and vocational education for out-of-school students came under numerous organizations under different ministries of the government – such as agriculture, health, rural development and so on – without proper coordination and linkages. This is a trend that continues to this day, with some 21 ministries engaged in the provision of vocational programmes. They cover a wide range of disciplines including agriculture and allied fields, business and commerce, engineering and technology, health and paramedical services, and many others (MSDE, 2019).

The demand for skilled workers began to grow strongly in the mid-1990s after economic liberalization. The NPE 1986 and the POA 1992 had laid out plans for strengthening vocational education, but it was not until the Eleventh Five-Year Plan (2007–2012), that there was sufficient focus on the task and a truly concerted effort made to strengthen vocational education and training (FYP, 2015). The PM's National Council on Skill Development, as well as the NSDC, were set up in 2008 as part of a 'Coordinated Effort on Skill Development' approved by the Cabinet (PM-NCSD, 2008). The first National Skill Development Policy formulated in 2009 also set very ambitious targets for skilling, aiming to train as many as 500 million youth by 2022.

The following sections discuss some provisions of the National Policy on Skill Development and Entrepreneurship (NPSDE) 2015 that superseded the policy of 2009, and then describe the transformative provisions of the new NEP 2020. This is followed up with a discussion of international priorities as reflected in the 2030 Agenda for Sustainable Development and the priorities of UNESCO, the organization responsible for Goal 4 of the agenda related to 'Quality Education'

In order to integrate vocational education with formal education, the NPSDE recommends that 25% of schools and colleges offer vocational education courses.

Above: College students in electronics lab. Nagpur, Maharashtra, India.

National Policy on Skill Development and Entrepreneurship 2015

The NPSDE, released in 2015, is the baseline document used by the MSDE for the provision of vocational education since its own inception (NPSDE, 2015). As stated in the policy document, its core objective is to empower individuals by enabling them to realize their full potential.

Some of its aims are summarized below.

- Make vocational education aspirational for youth, and to help employers see the increase in productivity so that they are willing to pay a premium.
- Provide vertical and horizontal pathways for youth through seamless integration of vocational training with formal education.
- Align the supply of skilled workers with sectoral requirements of industry and the strategic priorities of the country, and connecting supply with demand.
- Involve employers in setting occupational standards, helping develop curriculum, providing apprenticeship opportunities, participating in assessments, and providing gainful employment.
- Create a quality assurance framework that is aligned with global standards so as to facilitate mobility of labour.
- Recognize the value of on-the-job training and making apprenticeships integral to skilling.
- Promote increased participation of women and ensure that all other marginalized groups are adequately taken care of.

In order to integrate vocational education with formal education, the NPSDE recommends that 25% of schools and colleges offer vocational education courses. Simultaneously, the policy also sets out a framework for entrepreneurship some of the core objectives of which are listed below.

- Promote entrepreneurship, especially among women, and make it aspirational as a viable career option.
- Enhance support for potential entrepreneurs through mentorship and networks.
- Foster innovation-driven social entrepreneurship to address the needs of the population at the bottom of the pyramid, including socially and economically disadvantaged sections of society such as SCs, STs, OBCs, minorities and PwDs.
- Integrate entrepreneurship education into the formal education system.
- Ensure ease of doing business and facilitate access to finance.

Efforts to implement these policy goals are ongoing and are at various stages of progress. TVET provision has progressed very fast in the past five years leading to valuable on-ground implementation experience. Also, the NEP 2020 heralds a new momentum in TVET provision. It would therefore be worthwhile to re-examine the NPSDE and consider bringing in a revised policy that takes the achievements of the past into account and makes enabling provisions for the future. The provisions of the NEP 2020 described below are designed to help integrate vocational and entrepreneurship education into formal education, build on the progress made so far, and increase the uptake of TVET.

The National Education Policy 2020

The NEP 2020 gives considerable attention to TVET, noting that the integration of vocational education into ALL educational institutions – schools, colleges and universities – will trigger a change of mindset and help leverage its many benefits. In the current scenario, job-seeking youth cannot find work even as industry and businesses are short of the trained labour they need (NCAER, 2018). The rate of unemployment among the country's youth is at a 45-year high. To ensure that students receive the holistic education they need, the policy envisages that all schools expose middle school students (Grade 6 to Grade 8) to multiple vocations, and support each secondary school student (Grade 9 to Grade 12) to take up at least one vocation at a higher level of proficiency covering NSQF levels 1–4. The NEP 2020 sets a much more ambitious target than any of the previous policies by suggesting that at least 50% of all learners receive vocational education by 2025. Most of these students may likely continue into higher education after secondary school. However, as in South Korea, having even 25% to 40% of the secondary school cohort clear NSQF level 4 of vocational education will lead to a large workforce trained in various vocations, irrespective of whether they join the world of work afterwards or continue into BVoc courses at colleges and universities.

of all learners must receive vocational education by 2025 as suggested by the NEP 2020, a much more ambitious target than any of the previous policies.

The NEP also addresses some of the important lacunae in TVET provision so far, such as the lack of pathways for graduates from ITIs to move into higher education. It does this by specifying a new National Higher Education Qualification Framework (NHEQF) that will continue beyond the National Curricular Framework for School Education (NCFSE) to define 'graduate attributes'. The NCFSE and the NHEQF can be used in tandem with the NSQF, to provide seamless horizontal and vertical mobility to all students, but many challenges still remain to be overcome to reach every student.

A key focus of the NEP is on providing a broad-based liberal education beginning in secondary school and continuing into higher education, that will include access to vocational subjects.

The NEP 2020 is sending out the strong message that every student will receive vocational education so that it is not seen as separate from – and therefore inferior to – mainstream education.

The policy also aims to bring the focus back on experiential learning for improved student experience and quality of teaching. This can best be achieved when a student is connected to their community and is encouraged to apply classroom learning and knowledge towards addressing the community's challenges. Institutions currently providing diplomas and undergraduate degrees – such as polytechnics, colleges and universities, especially the skill universities – are expected to contribute towards lifting the quality of TVET provision towards the higher levels of competencies required in a knowledge economy.

As mentioned earlier, the implementation of the NEP will bring in a little over 280,000 secondary and higher secondary schools (UDISE 2018/19 provisional data) and more than 40,000 higher education institutions into the fold of potential TVET providers (AISHE, 2019). A concerted plan will need to be put in place for orienting the management and senior faculty at these institutions to devise innovative plans for integration, for identifying and stationing adequately trained teachers and trainers, and for providing apprenticeships to students that cover the practical training requirements of the TVET courses. The NEP proposes revising the National Curricular Framework for Teacher Education (NCFTE) as a means to re-orient and train teachers to create a large capacity for TVET connected to the local economies surrounding their educational institutions. Work on the revision is already in progress. The involvement of educational institutions in vocational education is likely to bring in more know-how and much more attention on the holistic development of students. This will be a huge improvement over the short-term training that industry provides that leaves students with little opportunity to develop competencies. The latter needs to be developed over a longer period, to allow adequate preparation time for students to grow into the occupations that they choose.

International priorities and UNESCO's 2015 recommendation and strategy for TVET

The year 2020 marks the fifth anniversary of the adoption of the Sustainable Development Goals (SDGs) 2030 by 193 countries at the UN General Assembly. The seventeen goals and associated 169 targets that came into force effective 1 January 2016 form a part of the UN's 2030 Agenda for Sustainable Development (UN, 2015), and will guide the development policies of all the partner countries. It is generally acknowledged that India's success in achieving the SDGs will have a large impact on the global outcomes. Fortunately, India's own development policies and priorities are closely aligned to these goals. India is also one of the countries that are likely to be the worst impacted by the increase in temperatures due to climate change (World Bank [WB], 2013). It is vulnerable to extreme heat, melting glaciers, rising sea levels, and changing rainfall patterns that will severely impact groundwater and water levels in rivers, threatening agriculture and food security, water and energy security, and increasing the frequency of natural disasters (Ministry of Earth Sciences [MoES], 2020). A strong focus on sustainable development and on greening TVET to mitigate these threats is therefore natural and very welcome.

India's success in achieving the SDGs will have a large impact on global outcomes. Fortunately, India's own development policies and priorities are closely aligned with these goals.

The 2030 Agenda also underscored the need for quality, reliable and disaggregated data to measure the progress on the targets, and the United Nations identified an indicative set of 232 distinct global indicators for monitoring the same.

After due consultation with all concerned ministries/departments, UN agencies and other stakeholders, the Ministry of Statistics and Programme Implementation (MoSPI) of the Government of India developed a National Indicator Framework (NIF) comprising about 300 national indicators. It also brought out a baseline SDG NIF report in 2019, and more recently, an NIF-based progress report on the performance of the country starting from 2015/16 (MoSPI, 2020). The NIF and the progress reports will be very useful in calibrating the performance and progress on the SDGs, both at the national and state levels.

The 17 Sustainable Development Goals

Source: https://sdgs.un.org/goals

TABLE 2

Performance of states and UTs on the SDGs

Source: NITI Aayog 2019

States/ UTs	SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 6	SDG 7	SDG 8	SDG 9	SDG 10	SDG 11	SDG 12	SDG 13	SDG 15	SDG 16	Complete SDG
Andhra Pradesh	69	35	76	52	37	96	86	78	66	68	36	57	70	86	86	67
Arunachal Pradesh	34	66	50	58	33	88	74	52	31	38	43	67	31	71	62	53
Assam	48	39	44	44	33	78	70	62	46	67	40	68	47	90	52	55
Bihar	33	26	44	19	40	81	62	64	47	74	50	47	43	54	64	50
Chhattisgarh	49	27	52	52	43	92	56	67	38	60	49	58	29	97	71	56
Goa	53	76	60	71	46	77	95	71	45	19	79	63	41	99	79	65
Gujarat	47	39	67	47	36	92	75	75	88	59	77	33	63	77	86	64
Haryana	47	43	65	68	36	81	77	71	73	54	49	39	34	40	76	57
Himachal Pradesh	60	44	67	81	52	82	64	76	70	78	79	52	61	92	84	69
Jharkhand	28	22	55	42	34	78	50	70	70	64	57	36	27	99	67	53
Karnataka	49	37	72	67	42	88	86	78	40	70	48	72	71	89	75	66
Kerala	64	74	82	74	51	77	70	61	88	75	51	57	56	98	77	70
Madhya Pradesh	40	24	50	54	45	92	62	67	44	68	55	58	47	94	63	58
Maharashtra	47	34	76	65	41	93	82	70	59	70	45	71	50	85	72	64
Manipur	42	69	62	70	34	87	72	27	43	81	28	85	37	100	70	60
Meghalaya	68	35	53	55	34	70	52	65	22	76	22	60	36	99	59	54
Mizoram	67	75	52	61	37	81	81	42	8	66	33	50	45	75	63	56
Nagaland	56	70	29	47	42	75	70	28	23	61	23	100	51	94	84	57
Odisha	47	34	61	40	35	85	50	59	72	69	51	44	69	99	61	58
Punjab	48	61	71	67	46	74	89	65	69	50	61	35	57	59	83	62
Rajasthan	56	35	58	51	39	76	61	65	38	70	61	30	60	75	76	57
Sikkim	65	66	59	58	49	79	97	68	27	64	74	60	38	100	69	65
Tamil Nadu	72	48	76	70	40	90	90	74	53	65	51	63	45	91	78	67
Telangana	52	36	66	64	26	84	93	82	61	94	62	58	66	88	77	67
Tripura	70	49	61	55	32	69	56	63	48	45	31	92	37	88	73	58
Uttar Pradesh	40	31	34	48	41	94	63	64	63	46	56	62	48	62	69	55
Uttarakhand	64	45	58	66	38	90	78	73	55	59	51	50	59	95	85	64
West Bengal	52	40	70	50	38	83	58	72	68	73	34	57	37	88	73	60
A and N Islands	48	38	65	61	48	85	73	55	13	94	47	69	72	85	65	61
Chandigarh	48	73	54	80	47	100	84	64	74	33	83	77	54	93	89	70
D and N Haveli	33	45	57	53	44	91	80	63	100	57	41	65	41	100	80	63
Daman & Diu	58	12	50	43	39	96	81	54	100	80	54	41	46	89	76	61
Delhi	54	56	54	64	27	61	96	60	100	69	63	39	30	82	64	61
Jammu & Kashmir	58	55	62	54	53	85	76	46	49	47	33	61	59	74	69	59
Lakshadweep	56	57	58	62	37	69	43	43	0	93	Nil	75	100	100	82	63
Puducherry	56	71	71	67	35	86	97	58	86	92	53	43	39	37	94	66
India	**50**	**35**	**61**	**58**	**42**	**88**	**70**	**64**	**65**	**64**	**53**	**55**	**60**	**66**	**72**	**60**
Target	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Achiever (100) | Front runner (65–99) | Performer (50–64) | Aspirant (0–49)

Below: On-job training for students taking the BVoc course in hospitality offered by TISS-SVE. Training by expert chefs at Taj Lands End. Bandra, Mumbai, India.

Opposite page: Civil engineering students conducting a material test. Mumbai, Maharashtra, India.

The NITI Aayog on its part has been bringing together the state governments to create a shared understanding of the SDGs. It has used the NIF to create the SDG India index and Dashboard 2019 that is aligned with all the 17 goals of the 2030 Agenda (NITI Aayog, 2019). The India index represents a robust framework for measuring the progress on SDGs at the state level and can help analyse and identify best practices and priority areas, in addition to promoting a healthy competition among states and UTs (see Table 2). A quick look at the table shows, not surprisingly, that gender equality (Goal 5) is uniformly poor across the country, and much progress remains to be made in the areas of all the core goals of No Poverty, Zero Hunger, Health and Well-being (Goals 1–3), and Quality Education (Goal 4).

Education and training are central to achieving the goals of the 2030 Agenda and are embodied in Goal 4 as follows.

> **Quality Education**: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

In the context of TVET, the Agenda sets the following targets for member states.

- Ensure equal access to affordable and quality TVET programme (Target 4.3).
- Substantially increase the number of youth and adults with relevant skills for employment, decent jobs and entrepreneurship (Target 4.4).
- Eliminate gender disparities in education and ensure equal access to education and TVET to the vulnerable including persons with disabilities (Target 4.5).
- Ensure that all learners acquire the knowledge and skills needed to promote sustainable development (Target 4.7).

Through the Goal 4 targets, UNESCO's strategy for TVET (2016–2021) aims to support member states in improving the relevance of their TVET systems. It endeavours to equip all youth and adults with the skills required for employment, decent work, entrepreneurship and lifelong learning, while contributing to the implementation of the 2030 Agenda for Sustainable Development as a whole (UNESCO, 2016b).

The strategy has three priority areas.

1. Fostering youth employment and entrepreneurship.
2. Promoting equity and gender equality.
3. Facilitating the transition to green economies and sustainable societies.

The UNESCO–UNEVOC network is the key driver for mutual learning, capacity-building and international cooperation on TVET. In line with the Global Action Programme on Education for Sustainable Development (ESD), UNESCO supports member states in greening TVET by adopting whole-institutional transformations. These entail building capacity – among leaders, education managers and teachers – for embedding sustainability concepts in TVET through implementation of systemic reforms.

UNESCO also works towards strengthening international and regional cooperation, fosters the UNEVOC network and inter-agency collaboration. In India, the PSSCIVE and the NSDC are members of UNEVOC and are actively engaged in these matters.

This report will look at the state of TVET education in India not only through the 'economic lens' of policy making – related to using TVET for employability in various sectors of the economy and for entrepreneurship – but also through the 'social lens' – the creation of livelihood opportunities for women, PwDs, and other socially and economically disadvantaged persons – and the 'transformational lens' that focuses on TVET for greening and for alignment with the SDGs (UNESCO, 2012; UNESCO, 2016).

Summary

The need to maintain a proper balance between the output of educational institutions and employment opportunities was mentioned already in the country's first education policy, NPE 1968. The Kothari Commission report, on which NPE 1968 was based, envisaged 50% of higher secondary students and 20% of secondary school students taking up vocational education, numbers that have not been achieved to this day. The second policy, NPE 1986, set more modest goals of covering 10% of higher secondary students by 1995, and 25% by the year 2000, which have not been met either.

The National Policy on Skill Development and Entrepreneurship set out many important objectives including making vocational education aspirational for youth, providing apprenticeships, creating a quality assurance framework, promoting increased participation of women, and providing vertical and horizontal pathways for youth through seamless integration of vocational training with formal education. Simultaneously, the policy also set out a framework for entrepreneurship, to foster innovation and enhance support for potential entrepreneurs through mentorship, networks and access to finance.

The NEP 2020 sets a much more ambitious target than any of the previous policies, by suggesting that at least 50% of all learners receive vocational education by 2025. The NEP also addresses some of the important lacunae in TVET provision so far, such as the lack of pathways for graduates from ITIs to move into higher education, through the specification of a new National Higher Education Qualification Framework that will be used in tandem with the National Skills Qualification Framework, to provide seamless vertical and horizontal mobility to students.

The year 2020 marks the fifth anniversary of the adoption of the Sustainable Development Goals (SDGs) 2030, by 193 countries including India, at the UN General Assembly in 2015. It is generally acknowledged that India's success in achieving the SDGs will have a large impact on the global outcomes. India is also one of the countries that is likely to be the worst impacted by the increase in temperatures due to climate change. Fortunately, India's own development policies and priorities are closely aligned with these goals.

The NITI Aayog has been bringing together state governments to create a shared understanding of the SDGs and has created the SDG India index and Dashboard 2019 that is aligned with all 17 goals of the 2030 Agenda. The dashboard shows, not surprisingly, that gender equality (Goal 5) is uniformly poor across the country, and significant progress remains to be made in all four core areas of no poverty, zero hunger, health and well-being (Goals 1-3), and quality education (Goal 4).

LIVELIHOOD OPPORTUNITIES

This Training cum Production Centre empowers women with livelihood opportunities under the American India Foundation's Market Aligned Skills Training (MAST) programme. Rewari, Haryana, India.

CHAPTER 4

Progress and achievements

This chapter describes some notable efforts made by key stakeholder groups towards TVET provision in India. The aim is to showcase the institutional framework that is presently available, and to critically assess the progress and achievements so far.

4 Progress and achievements

Institutional framework for the provision of TVET

TVET in India is provided by organizations that are affiliated to government ministries such as the Ministry of Skill Development and Entrepreneurship (MSDE), the Ministry of Education (MoE) and others, and to industry.

The organizations include:

1. Industrial training institutes (ITIs), both public and private, and polytechnics.
2. Secondary and higher secondary schools, colleges and universities.
3. Private vocational training partners affiliated to the National Skills Development Corporation (NSDC).
4. Companies that provide in-house training, but also offer apprenticeships separately.
5. Organizations under other government ministries.

Efforts to provide technical training go back to the pre-independence era. Since then, several ministries have provided vocational training in their respective areas through their own institutions. Yet, the organizational structure assigned by governments to the provision of vocational education remained inadequate, leaving state governments ill-equipped to implement policies. The lack of organizational structure was identified by the Programme of Action (POA) 1992 of the second education policy (NPE 1986) as the single most important factor behind the slow uptake of vocational education till the late 1980s. The POA 1992 sought to address this and indeed set up some formal structures for the provision of vocational education, but a more robust framework for creating infrastructure – catering to the end-to-end aspects of skilling – was established only after 2008. In the following subsections, we will discuss this infrastructure which includes – besides the various ministries and the NSDC – the sector skill councils (SSCs), the National Skills Qualification Committee (NSQC), the National Council for Vocational Education and Training (NCVET) and other bodies at both central and state levels. Many of these organizations have evolved considerably in the last decade, and our aim is to focus on their current status and achievements.

Right: Students enrolled in the BVoc course in dialysis technology offered by TISS-SVE learn to use the equipment at the Apex Kidney Care Centre. Mumbai, Maharashtra, India.

Opposite page: A member of the Indian team applies finishing touches to his gold creation. India won a Bronze Medal in Jewellery Design. WorldSkills 2019, Russia.

equity of NSDC is owned by the Government of India and the remaining 51% is held by 10 industry associations.

Key institutions: the NSDC and its partner ecosystem

The NSDC was envisioned to be a private sector-led body, driven by market needs as well as the nation's priorities in terms of skill development. The Government of India owns 49% of NSDC equity and the remaining 51% is held by ten industry associations. In its role as a market catalyst, it has trained over 25 million youth as of December 31 2019, utilizing US$200 million from the National Skill Development Fund (NSDF) of the MSDE, and over US$430 million in private sector funds (Source: NSDC). It has created a network of 636 training partners (TPs) that cover 660 of the 741 districts in the country, across 29 states and 5 Union Territories. Under the TPs, 10,800 training centres teach over 1,800 courses in 39 sectors, with an annual training capacity of over 5 million. NSDC was made a part of MSDE when the latter was created in 2015, through an investment management agreement and the National Skill Development Fund (see also Figure 1, Page 24).

Role of NSDC in the Skilling Ecosystem

The key roles of NSDC are:

1. Financing the ecosystem.
2. Implementing central government schemes.
3. Creating and governing the SSCs.
4. Capacity building of state institutions.
5. Expanding industry connect for its activities.
6. Overseeing standards, curriculum and trainers.
7. Provisioning technology enablers such as Skill Development & Management System (SDMS) and the Skill Management & Accreditation of Training Centres (SMART).
8. Managing international collaborations.
9. Engaging in knowledge exchange as a UNEVOC network partner.
10. Creating and sharing market analytics through its SkillsIP intelligence platform.

The SDMS, in the form of the Skill India portal of the NSDC, is a repository of training data of the 25 million youth who have been trained so far.

Source: NSDC

37

SSCs are operational today, including two cross-functional ones on green jobs and on PwDs

Above: Team India representatives test their robot before the final competition. WorldSkills 2019, Russia.

SECTOR SKILL COUNCILS: ALIGNING TRAINING WITH INDUSTRY

The number of sector skill councils (SSCs) created by the NSDC and their roles have seen some fluctuation in the ensuing years. At present there are 37 SSCs including two cross-functional ones on green jobs and on PwDs.

SSCs consist of representatives from industry, government and academia to ensure participation of all ecosystem stakeholders. The SSCs are meant to contribute to the following four broad categories of activities:

The role of SSC

1 Training need analysis	2 Curriculum development	3 Roll-out of training	4 Assessment and certification
Determining the demand for skilled manpower.	Developing curriculum, based on competencies needed for each occupation.	Providing certified trainers and assessors. Sourcing master trainers from industry.	Assessing relevant competencies and certifying trainees.

SSCs help align courses to industry needs through the following means:

1. Creating occupational standards, curriculum and content and creating assessment protocols for these standards.
2. Benchmarking national standards with international standards.
3. Developing accreditation and affiliation protocols for training institutes.
4. Providing certified trainers and assessors, and sourcing master trainers from industry.
5. Developing Centres of Excellence (COEs).

FINANCING BY NSDC

Training providers are affiliated with NSDC and work closely with the SSCs to conduct both classroom and practical training as per industry-recognized occupational standards. They mobilize students for courses and provide placement assistance. NSDC provides project financing of various types to the TPs including debt at subsidized rates; equity and grant funding only in some cases; project-based financing for skilling businesses covering up to 85% of project costs over a tenure of 7 years; innovation financing; setting up of COEs and more. It also assists TPs in getting working capital from banks to help cope with the long gestation period in collecting payouts from skilling projects. NSDC then monitors these training partners on both financial and social parameters. On the financial side, it conducts periodic credit reviews, analysis of utilization and financial statements, and independent audit to assess fund utilization and possible misappropriation, among others. On the social side, it hand-holds TPs through their life cycle, maintains routine Management Information Systems (MIS) for performance monitoring and validates reported data through centre visits and calls to trainees, and so on.

MARKET LED – PORTFOLIO UPDATE

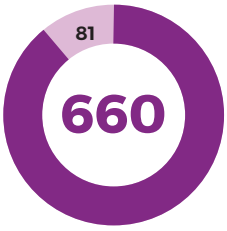
Coverage

10,800+ operational centres

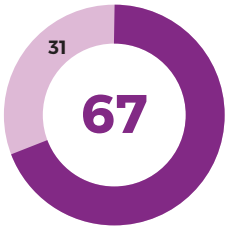
29 states and 5 UTs

39 sectors

1800+ courses

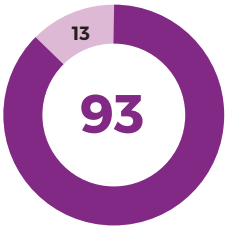


out of 741 districts covered



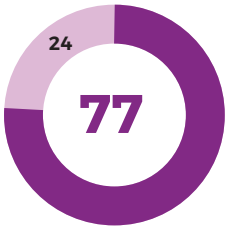
smart cities covered

9,17,000+ training



out of 106 LWE districts covered

4,37,000 training



out of 101 aspiring districts covered

2,90,000 training

Current Partnership

636 approved TPs

371 funded TPs

265 non-funded TPs

Current Progress

15 million candidates trained

5.42 million candidates placed

7,12,000 self employed

4.66 million women trained

12,800+ PwD trained

5.15 million OBC/SC/ST Trained

The fee-based model of training has seen considerable uptake, and accounts for more than half of these candidates. In this model, students pay for aspirational courses that are offered by NSDC training partners, both funded and non-funded, with the latter playing the role of catalyst. Over 15 million youth have been trained under this market-led component, many of them in high-demand job roles across more than 35 priority sectors including renewable energy efficiency specialists, smart cities implementers, solar technicians, rooftop gardening and food and beverage services specialists, among others.

Ministries engaged in the provision of vocational training

MSDE is now the nodal ministry for skill development initiatives, and responsible for coordination among the various government ministries engaged in the same. The NSDC and its partner ecosystem have created an end-to-end infrastructure for identifying youth interested in a particular occupation; training, assessing and certifying them; and finding placement. As a result, a useful convergence is now building up, replacing the disparate efforts of the various ministries, who are beginning to lean towards using the NSDC ecosystem rather than creating their own training infrastructure.

As mentioned earlier, there are as many as 19 ministries besides the MSDE and the MoE that are engaged in vocational training. Several of these – such as the Ministries of Agriculture; Commerce and Industry; Micro, Small and Medium Enterprises (MSME); Textiles; and Tourism – have set up their own training centres to meet the skill needs of their sectors. Several others (listed below) do not have separate training infrastructure of their own and conduct only short-term training courses of a generic nature with the help of private sector training providers or NSDC training partners.

Some ministries providing short-term training through NSDC partners

Ministries	Trainees
Ministry of Development of North Eastern Region	Youth from North Eastern states
Ministry of Minority Affairs	Minority youth
Ministry of Social Justice and Empowerment	Youth from the Scheduled Castes
Ministry of Rural Development	Persons living below poverty line in rural areas
Ministry of Tribal Affairs	Youth from the Scheduled Tribes
Ministry of Women and Child Development	Women

Standards and frameworks

The National Skills Qualification Framework (NSQF) adopted by India comprises 10 levels, representing increasing levels of complexity in terms of the knowledge, competence and autonomy that must be demonstrated by the learner (NSQF, 2013). Each level is defined by five parameters (see Table 3).

1. Process, comprising a general summary of the other four domains corresponding to the level.
2. Professional knowledge that the learner needs to have at that level of the field of study.
3. Professional skills or the tasks that a learner should be able to perform competently.
4. Core/general/soft skills that enable the learner to work productively, also as part of a team.
5. Responsibilities that the learner can be entrusted with, on their own, under supervision, and the level at which the learner can supervise others.

The NSQF specifications at the time of its adoption in December 2013, carried with it timelines for its own implementation. By 27 December 2018, it would become mandatory for all training/educational programmes/courses to be NSQF-compliant and to define admission eligibility criteria for various courses in terms of NSQF levels (NSQF, 2013). Although this goal – of complete compliance with the framework by the year 2018 – has not yet been met, considerable efforts have been made towards it and much experience gained.

TABLE 3
Descriptors of the 10 NSQF levels

Level	Process required	Professional knowledge	Professional skill	Core skill	Responsibility
LEVEL 1	Prepares person to carry out processes that are repetitive on regular basis, require no previous practice.	Familiar with common trade terminology, instructional words, meanings and understanding.	Routine and repetitive, takes safety and security measures.	Reading and writing; addition, subtraction; personal financing; familiarity with social and religious diversity, hygiene and environment.	No responsibility; always works under continuous instruction and close supervision.
LEVEL 2	Prepares person to carry out processes that are repetitive, on a regular basis, with little application of understanding, more of practice.	Material, tools and applications in a limited context, understands context of work and quality.	Limited service skills used in limited context; select and apply tools; assist in professional works with no variables; differentiate good and bad quality.	Receive and transmit written and oral messages, basic arithmetic, personal financing, understanding of social, political, and religious diversity, hygiene and environment.	No responsibility; works under instruction and close supervision.
LEVEL 3	Person may carry out a job which may require limited range of activities, routine and predictable.	Basic facts, process and principle applied in trade of employment.	Recall and demonstrate practical skill, routine and repetitive, in a narrow range of application.	Written and oral communication, with minimum required clarity, skill of basic arithmetic and algebraic principles, personal banking, basic understanding of social and natural environment.	Under close supervision. Some responsibility for own work within defined limit.
LEVEL 4	Work in familiar, predictable, routine situation of clear choice.	Factual knowledge of field of knowledge or study.	Recall and demonstrate practical skill, routine and repetitive in narrow range of application, using appropriate rule and tool, using quality concepts.	Language to communicate written or oral, with required clarity, skill to basic arithmetic and algebraic principles, basic understanding of social political and natural environment.	Responsibility for own work and learning.
LEVEL 5	Job that requires well-developed skill, with clear choice of procedures in familiar context.	Knowledge of facts, principles, processes and general concepts in a field of work or study.	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information.	Desired mathematical skill; understanding of social, political; and some skill of collecting and organizing information, communication.	Responsibility for own work and learning and some responsibility for others' works and learning.
LEVEL 6	Demands a wide range of specialized technical skill, clarity of knowledge and practice in broad range of activity involving standard and non-standard practices.	Factual and theoretical knowledge in broad contexts within a field of work or study.	A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study.	Reasonably good in mathematical calculation, understanding of social, political and reasonably good in data collecting, organizing information, and logical communication.	Responsibility for own work and learning and full responsibility for others' works and learning.
LEVEL 7	Requires a command of wide-ranging specialized theoretical and practical skills, involving variable routine and non-routine contexts.	Wide-ranging factual and theoretical knowledge in broad contexts within a field of work or study.	Wide range of cognitive and practical skills required to generate solutions to specific problems in a field of work of study.	Good logical and mathematical skill understanding of social, political and natural environment and organizing information, communication and presentation skill.	Full responsibility for output of group and development.
LEVEL 8	Comprehensive, cognitive, theoretical knowledge and practical skills to develop creative solutions to abstract problems. Undertakes self-study; demonstrates intellectual independence, analytical rigour and good communication.			Exercise management and supervision in the context of work/study having unpredictable changes; responsible for the work of others.	
LEVEL 9	Advanced knowledge and skill. Critical understanding of the subject, demonstrating mastery and innovation, completion of substantial research and dissertation.			Responsible for decision making in complex technical activities involving unpredictable work/ study situations.	
LEVEL 10	Highly specialized knowledge and problem solving skill to provide original contribution to knowledge through research and scholarship.			Responsible for strategic decisions in unpredictable complex situations of work/study.	

Source: https://www.nsda.gov.in/assets/documents/nsqf/NSQF%20LEVEL%20DESCRIPTORS.pdf

Opposite page: Welding technicians' (NSQF level 3) course at Learnet Skills. Okhla, New Delhi, India.

Below: Training in progress at an advanced auto body paint shop following latest industry standards at the Industrial Training Institute (ITI), Pusa. New Delhi, India.

The National Occupational Standards (NOS) on the other hand, specify the standard of performance required when carrying out a function in the workplace, as well as the knowledge and understanding that the student must have in order to meet the standard consistently. Each NOS defines one key function in a job role, and a set of NOSs form a Qualification Pack (QP) aligned to a job role. The QPs and NOSs for each job role and level are formulated by the concerned industry through the sector skill councils, which are then used by the latter to create curriculum and assessments. A QP is generally available for every job role in each industry sector. According to the NSDC, well over 13,261 NOSs and 2,383 QPs have been defined in 42 sectors of the economy as of 18 August 2020. Given that these have been defined largely only until NSQF level 5, it is apparent that the NOSs have been defined at a very fine-grained level[6]. The NOSs and QPs go through a process of approval with the National Skills Qualification Council (NSQC) before becoming available in the National Qualifications Register (NQR)[7], from where training providers can pick them up for use in curriculum creation.

In theory, the NSQF enables competency-based training for every job role in industry by making it possible to align courses across all the different providers to job roles at specific NSQF Levels. A particular occupation such as plumbing can support training at different NSQF levels representing different levels of proficiency of the individual. However, the mapping has not been smooth for a variety of reasons. The SSCs have prepared over 1,800 model curricula that are followed by the training providers. However, the SSCs find it easier to create courses as per the NOS specifications because they are more fine-grained and support the mixing of multiple skills, as is often required by employers. The QPs themselves have shorter life spans and need to be updated regularly. As many as 1,600 QPs are under review at present (Source: NSDC). Both the NSDC and the Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE) appear to favour the NOS based approach at present, signalling an important new trend that needs to be noted.

The bulk of the QPs are NSQF–aligned courses but the process of alignment is not without its problems, some of which will come starkly to the fore when educational institutions are brought into the picture. This is because there is a wide variation in educational qualifications (entry profile) required for the same NSQF level in different occupations. For instance, NSQF level 5 courses in healthcare, IT, IT-enabled services (ITeS) and some others require a student to have completed Grade 12 in school. However, NSQF level 5 in the construction industry for the roles of masons, carpenters, bar benders, construction fitters etc. only require an individual to have completed Grade 5 in school. These differences in entry qualifications can present a barrier for horizontal mobility across some occupations. Several of the current ills in the skills ecosystem owe their origins to poor understanding among stakeholders of the role the qualification framework plays in the skills ecosystem. This is also true internationally and there are very few countries where qualification frameworks have been successful.

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6 https://skillsip.nsdcindia.org/sites/default/files/kps-document/An%20Introduction%20to%20Occupational%20Standards.pdf

7 https://www.nqr.gov.in/about-us

Flagship TVET programmes of the Government of India

This section presents some of the flagship TVET programmes run by ministries of the Government of India. It also discusses the role of state governments and of industry in TVET provision and touches upon ongoing efforts to strengthen the TVET provision ecosystem.

Technical training through Industrial Training Institutes and polytechnics

The first vocational training courses instituted after independence were offered through the Craftsmen Training Scheme at the ITIs. Students who have completed Grade 8 or Grade 10 in school can still take these courses and receive the National Trade Certificate (NTC) on completion. The number of these institutions is not very large relative to their target populations, so these opportunities are not available very widely. At the time of preparation of the Eleventh Five Year Plan, there were about 5,114 ITIs imparting training in 57 engineering and 50 non-engineering trades. Presently, there are 14,782 ITIs, of which 2,200 are run by the government. The duration of the courses vary typically between one and three years, depending on the specific course. ITIs also offer longer courses leading to diplomas. The total intake capacity at ITIs is approximately 2.39 million with only 1.6 million utilized in 2019 (NCVT–MIS, 2020).

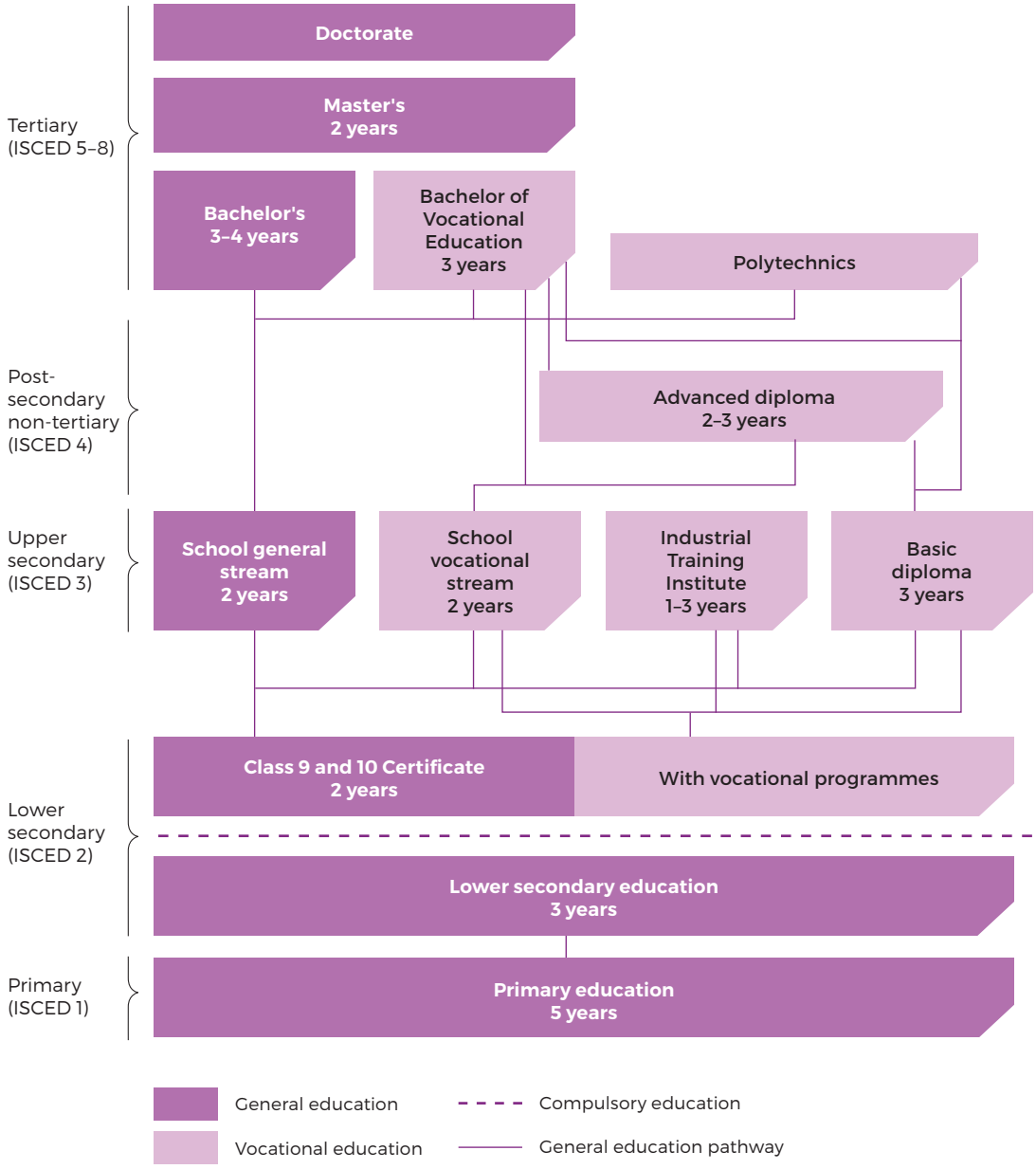
ITIs provide training primarily for job roles in manufacturing and have had a mixed record of success. Given that the curriculum is not revised often enough, industries sometimes have to retrain the graduates they absorb. Other graduates end up working in the informal sector or become self-employed. According to the latest India Skills Report, the employability of ITI alumni has shown a dramatic downturn, falling from approximately 47% in 2014 to under 30% in 2018 (ISR, 2020). This is a matter of some concern as ITIs are key institutions for the provision of TVET in India. It is clear that traditional areas of weakness, such as quality of the curricula and trainers, mode of teaching, quality of infrastructure, processes for assessment and certification, and alignment of skills training to actual demand, have contributed in varying degrees to low employability, signalling a need for better quality assurance systems (see Chapter 5). The lack of employability of graduates in organized industry is also partly due to the failure of employers to remain engaged with the ITI system on a continuous basis. Despite the weaknesses however, studies suggest that the ITIs remain the best option that the industry has today for hiring skilled workers (Mehrotra, 2014).

More recently, the MSDE has extended the Dual System of Training (DST) to many ITIs whereby students can avail apprenticeships in industry, just as in the German dual model. The MSDE's Directorate General of Training and the MoE's National Institute of Open Schooling (NIOS) have signed an MoU to put in place a system for assigning academic equivalence to vocational/ITI qualifications, paving the way for ITI candidates to attain secondary/higher secondary qualifications (MSDE 2018). The Skills

Strengthening for Industrial Value Enhancement (STRIVE) project, partially funded by the World Bank, aims to upgrade competitively selected ITIs in order to enhance their delivery quality. The project marks a shift in the government's implementation strategy in TVET, away from input-based to an outcome-based skill ecosystem.

Polytechnics provide long-term technical education to students who have completed Grade 10, leading to a three year diploma in various branches of engineering. Some also offer advanced diploma courses of one to two years duration. There are currently 3,440 standalone polytechnics with an intake capacity of 1.51 million students (AISHE 2019), up from 1,244 polytechnics at the time of the 11th Five Year Plan. Polytechnics diploma holders keen to take up higher education are allowed lateral entry into engineering programmes in the second year, which is a very popular option. Polytechnics were moved out from MoE to MSDE in 2017. Although there are other standalone institutions associated with the AICTE that offer diplomas in pharmacy, nursing, hotel management etc., these have remained with the MoE, which does not reflect very consistent thinking within government. The pathways between schools and long-term training options through ITIs and polytechnics is shown in Figure 2.

FIGURE 2
Pictorial representation of TVET in the Indian Education System



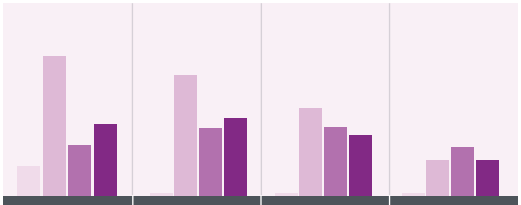
Source:
UNESCO–UNEVOC TVET country profile India (UNESCO, 2018b)

Pradhan Mantri Kaushal Vikas Yojana (PMKVY II)

Launched on 15 July 2015 – World Youth Skills Day – and based entirely on government grants, the Pradhan Mantri Kaushal Vikas Yojana was the flagship skills training scheme of the newly created MSDE. The experience of the first year was used to revise and extend the scheme to PMKVY II for a period of four years, 2016–2020 (PMKVY 2016). The scheme consists of three parts – short-term training (STT), Recognition of Prior Learning (RPL) and special projects. STT targets candidates who are either school/college dropouts or unemployed – often referred to as the 'not in employment, education or training' segment (NEET) – and provides training for 150 to 300 hours depending on the job role. It is managed by NSDC in two parts. A centrally sponsored and centrally managed (CSCM) component with almost 80% of the allocation and targets, and a centrally sponsored but state managed (CSSM) component which has the remaining 20%. Between STT, RPL and special projects (the latter two described below) the PMKVY II scheme has successfully achieved its target of benefiting 10 million youth over its four-year tenure (see Figure 3).

FIGURE 3
Progress of PMKVY II scheme

STT AND SPECIAL PROJECTS



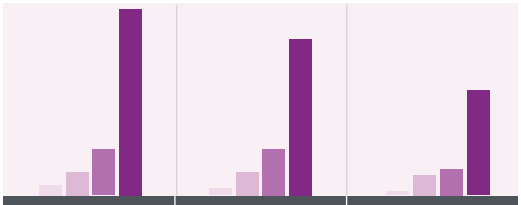
	Total enrolled	Total trained	Total certified	Reported placed
FY 2016/17	396,433	50,854	10,248	281
FY 2017/18	1,891,461	1,624,752	1,186,404	453,003
FY 2018/19	676,578	900,415	8,99,433	671,184
FY 2019/20	945,728	1,032,536	8,32,345	49,3321
Total	**3,913,200**	**3,608,557**	**2,928,430**	**1,617,789**

* additional 40K+ candidates enrolled on SIP in NE Region after 17 March 2020

Training
Out of total certified
Youth >90%
Females >52%
SC/ST/OBC >55%

Rs **35** bn +
funds disbursed for STT + SPL

RPL



	Total enrolled	Total trained	Total certified
FY 2016/17	2,00,781	173,031	74,856
FY 2017/18	5,16,940	530,131	438,291
FY 2018/19	1,049,922	994,426	558,893
FY 2019/20	4,199,758	3,588,589	2,336,352
Total	**5,967,401**	**5,286,177**	**3,408,392**

* additional 2,23,000 enrolled on SIP

Training
Out of total certified
Youth >47%
Females >34%
SC/ST/OBC >42%

Rs **5.45** bn +
funds disbursed for RPL

Source: NSDC

NSDC-affiliated training providers conduct both classroom and practical training as per industry-recognized NOS that are mapped to NSQF levels 5 and below. They also impart training in soft skills, entrepreneurship, financial and digital literacy. The certification is done by assessors nominated by the SSCs. The total training capacity is now 5 million seats per annum after about five years of operation. Upon successful completion of training, candidates are provided placement assistance by Training Partners (TPs). As seen from the data in Table 4, a little over 3.4 million youth have been trained as part of the CSCM component and only just over 1.56 million placed. This indicates issues such as lack of skill-gap analysis, scope and quality of training, lack of adequate counselling and guidance during youth mobilization and so on. Under PMKVY, the entire training and assessment costs are paid for by the GoI through the NSDC. The latter also manages the grants for skilling from other ministries such as defence, railways and home affairs, among others.

TABLE 4

PMKVY 2016–20 CSCM STT update as per SDMS report dated 23 March 2020

State	Enrolled	Trained	Assessed	Certified	Reported placed
A&N	480	480	473	465	124
Andhra Pradesh	1,07,961	1,07,721	1,01,872	92,217	59,754
Arunachal Pradesh	5,314	5,314	5,069	4,648	1,986
Assam	77,374	77,344	67,535	58,648	28,654
Bihar	1,98,405	1,98,225	1,85,389	1,60,401	84,398
Chandigarh	6,272	6,272	5,964	5,172	2,260
Chhattisgarh	66,796	66,744	61,804	53,418	20,820
DNH	1,110	1,110	1,102	922	661
Daman & Diu	1,485	1,485	1,475	1,302	947
Delhi	1,26,091	1,26,061	1,14,131	1,04,304	53,296
Goa	1,292	1,292	946	873	660
Gujarat	76,938	76,758	70,337	63,040	34,054
Haryana	2,49,030	2,49,001	2,32,832	2,12,105	1,30,881
Himachal Pradesh	41,052	40,914	37,687	34,143	16,608
Jammu & Kashmir	88,392	88,392	82,705	74,580	40,420
Jharkhand	54,042	53,922	49,382	43,003	20,767
Karnataka	96,838	96,679	89,548	79,583	41,240
Kerala	45,572	45,572	41,022	36,398	16,756
Madhya Pradesh	3,19,963	3,19,753	3,00,658	2,66,560	1,53,521
Maharashtra	1,25,477	1,25,368	1,13,757	98,362	49,959
Manipur	9,731	9,701	8,274	6,751	2,706
Meghalaya	9,395	9,395	8,521	7,513	3,749
Mizoram	3,940	3,940	3,389	3,013	1,070
Nagaland	4,685	4,685	3,829	3,404	1,456
Odisha	1,13,240	1,12,984	1,03,643	91,662	51,271
Puducherry	5,637	5,607	5,249	4,761	3,099
Punjab	1,67,792	1,67,642	1,59,523	1,45,931	79,679
Rajasthan	2,89,233	2,89,148	2,73,880	2,51,158	1,37,158
Sikkim	3,091	3,091	2,827	2,605	1,043
Tamil Nadu	1,66,889	1,66,859	1,51,161	1,36,743	91,969
Telangana	1,30,072	1,30,072	1,21,526	1,10,513	71,810
Tripura	13,012	13,012	11,669	10,213	5,720
Uttar Pradesh	5,55,263	5,54,693	5,16,567	4,55,732	2,43,901
Uttarakhand	63,258	63,228	57,213	49,696	27,983
West Bengal	1,75,153	1,74,743	1,62,037	1,43,931	83,983
Total	**34,00,275**	**33,97,207**	**31,52,996**	**28,13,770**	**15,64,363**

Source: NSDC

A third-party impact evaluation of PMKVY II shows that several benefits have accrued to the trainees under the Short-Term Training (STT) component (NSDC, 2019):

- Trained and certified individuals were found to be 1.8 times more likely to get employed than the individuals in the comparison group.
- The average monthly income of PMKVY trained and certified individuals was 15% higher than that of the comparison group.

An internal analysis of the data pertaining to individuals trained under PMKVY II between October 2016 and February 2020 shows the following (NSDC, 2020):

- Women trainees under the programme had a higher placement rate (47.1%) as compared to men (44.1%), across age groups and educational attainment categories.
- In 15 of the top 20 job roles – accounting for 65% placements – average monthly income of women was lower than that of men.

The report analyses and compares indicators at various stages of the skilling value chain such as dropout rates, failure rates and placement rates for both men and women. It also compares gender outcomes across age groups, education levels, states, sectors and job roles.

The Recognition of Prior Learning (RPL) component of the PMKVY II assesses and certifies individuals with prior learning experience or skills. RPL mainly focuses on individuals engaged in the informal sectors. The objectives of RPL, as mentioned in the PMKVY II guidelines document, are as follows (PMKVY 2016):

- Align the competencies of the country's unregulated workforce to the standardized NSQF framework.
- Enhance the career/employability of an individual and provide them with alternative routes into higher education.
- Provide opportunities to reduce inequalities that have risen from privileging certain forms of knowledge over others.

All RPL candidates undergo a 5-step RPL process of mobilization; counselling and pre-screening; orientation; final assessment; certification and pay out. RPL can be availed by anyone who fits the minimum age criteria as per the relevant QP requirements. The orientation process is designed to cover a minimum of 6 hours and candidates are required to be offered bridge courses as needed to prepare them for the final assessment based on the QPs. There is a modest pay out to the student at the completion of the certification process.

A third-party impact evaluation involving a sample of 870 individuals shows many are benefiting under RPL (NSDC 2019b).

- 79% of the employed RPL respondents agreed or strongly agreed that the programme improved their confidence towards getting better employment.
- Over 75% respondents agreed that their technical and soft skills had improved.
- 75% respondents said they were better prepared for their current employment.
- The average monthly income was observed to be 25% higher after certification under RPL.

Source: NSDC 2020

Opposite page and below: Home health aide training under way at the Pradhan Mantri Kaushal Kendra. Opportunities for caregivers is on the rise due to a boom in demand for healthcare services at home, especially for the elderly. New Delhi, India.

Above: Beneficiaries of American India Foundation's Rickshaw Sangh programme attend a loan repayment meeting. Rickshaw Sangh is a unique financial inclusion programme transforming rickshaw pullers and their spouses into asset owners. Bajitpur, West Bengal, India.

Opposite page: An rural Indian farmer in his cotton field receives training from an agronomist. TVET can play an important role in transforming rural livelihoods.

These results are extremely encouraging and indicate that much more attention needs to be paid to RPL to ensure that its benefits become available uniformly, through stringent quality control of the process. MSDE has launched a dedicated portal for the RPL programme[8] which will provide a platform for individuals to get information of RPL centres across the country and register for upcoming batches. According to NSDC, as of 17 March 2020, over 5.2 million individuals had been trained under the RPL and 3.4 million certified. Of these, over 47% are youth and over 34% are women.

A separate internal survey by NSDC – with over 26,000 responses via automated telephonic calls – found that 47% of respondents reported an increase in monthly income, and 63% felt that their skills were more appreciated at the workplace. The survey found that greater appreciation at the workplace was also linked to higher likelihood of salary increases, and that RPL was more effective in improving monthly income for those with no education (67% saw an income increase) and lower years of school (48% of those who have studied up to 8th Grade saw their incomes increase) (NSDC, 2019b).

'Special projects' comprise the third component of PMKVY. These include:

- High-social-impact endeavours such as training jail inmates.
- Training targeted at vulnerable groups such as primitive tribes.
- Training for special women's' groups such as those from the slums, or assisting women artisans to become village level entrepreneurs.
- Engagement with government organizations such as the police to train needy youth in order to reduce repeat offences.
- Training for juvenile home inmates and others.

Training schemes for rural youth by the Ministry of Rural Development

The Ministry of Rural Development (MoRD), in association with banks and Non-Governmental Organizations (NGOs), has undertaken entrepreneurship and skill building of rural youth towards self-employment. The reported success rate is 70% in areas with a pre-existing market for the goods or services produced. Training has been provided through twenty-seven Rural Development and Self-Employment Training Institutes (RUDSETI), the first of which was set up in Karnataka as early as in 1982. RUDSETI's philosophy is to motivate unemployed rural youth to take up self-employment through a combination of short-term training and long-term support and guidance. The programmes are residential in nature with food, accommodation and training provided free of cost. The unemployed youth are trained not only in the skill of their interest, but are also given behavioural inputs or soft skills to help them start their own venture, with or without financing from banks. The success of RUDSETI lies in the rate of establishment of new ventures by trainees that stands at an amazing 69%. Inspired by the success of these institutions, the ministry established a Rural Self-Employment Training

[8] http://pmkvyofficial.org/RPLDAP/

Institute (RSETI) in each district, beginning in 2009, with the district's major bank taking the lead in establishing the institute. Presently there are 582 RSETIs that have trained over 3.19 million unemployed candidates, out of whom 69% – 2.19 million candidates – have been successfully set up as on 30th June 2019 (RSETI, 2019).

The vision for the Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY) scheme run by the MoRD is to transform economically disadvantaged rural youth into an economically independent and a globally relevant workforce (DDU-GKY 2014). DDU-GKY is a part of the National Rural Livelihood Mission (NRLM), tasked with the dual objectives of adding diversity to the incomes of rural families living in poverty and catering to the career aspirations of, rural youth. It is uniquely focused on youth between the ages of fifteen and thirty-five years from economically disadvantaged families and provides free training. As a part of the Skill India campaign, it plays an instrumental role in supporting the government's social and economic programmes such as the Make in India, Digital India, Smart Cities, Start-Up India, and Stand-Up India campaigns.

DDU-GKY is present in 690 districts across 29 states and UTs, impacting youth from over 7,427 blocks. It currently has over 1,602 projects being implemented by over 737 partners, in more than 552 trades from 52 industry sectors. Several educational institutions of repute, corporate training houses and NGOs have been sanctioned projects under DDU-GKY, and the scheme is the first skill training initiative in the country to have set benchmarks in minimum standards and service delivery quality through its framework of guidelines and standard operating procedures (SOPs). DDU-GKY approves training programmes with curriculum identified in the qualification packs (based on National Occupational Standards) by the respective sector skill councils of NSDC. As of October 2020, over 1.01 million candidates have been trained and over 0.56 million candidates placed in jobs. Real-time data regarding the progress of the scheme is available at the Kaushalpragati[9] website. DDU-GKY has committed an investment of more than US$800 million so far.

Jan Shikshan Sansthan

Jan Shikshan Sansthan (JSS) or People's Learning Centre provides training for adult workers in the informal sector. The programme was launched as early as in 1967 as an adult education initiative aimed at improving vocational skills and the quality of life of workers – especially in the rural areas – by identifying skills that have a market in the region. The scheme targets rural adults and youth, imparts essential skills training, grows the local trades and creates new opportunities for locals. The JSSs impart vocational skill training programmes at beneficiaries' doorsteps at minimum cost and infrastructure. They do not work in isolation, conducting convergence programmes with various departments. JSSs impart training in a variety of trades or courses such as cutting and tailoring, soft toy making, bag-making, electrical repairs, food processing, welding, auto repairing, plumbing, *zari* work etc.

The JSS scheme of supporting voluntary agencies (NGOs) for adult education was transferred from the MoE to the MSDE in July 2018. As per the scheme's website, there are currently 248 JSSs spread over 27 States and 2 UTs in the country. The JSSs are set up under the aegis of either a voluntary organization (as its parent body) or a university or an independent agency under The Societies Registration Act, 1860. All JSS expenses are funded by the Indian government through an annual recurring grant. The affairs of the Sansthans are managed by an independent Board of Management constituted for a period of three years with the concurrence of the Government of India. It is mandatory for all JSSs to register with the Darpan portal of NITI Aayog, which is a space for NGOs and voluntary organizations in the country to interface with key government ministries, departments and other government bodies. MSDE has also launched an MIS portal for enhanced monitoring and management, and to scale up the operation of the JSS scheme. The ministry now plans to create a JSS in every district in the country.

[9] https://kaushalpragati.nic.in/login/login.do?methodName=showMainPage

National Apprenticeship Promotion Scheme

The number of apprentices in India in 2019/20 is just **.28 million**, which is 0.06% of the workforce, tiny relative to most countries.

Apprenticeships, the traditional way to provide practical training in an industry environment – as in the German Dual system[10] – have not been integral to TVET in India until recently. Apprenticeships are a win-win model for both industry and apprentice since it leads to the creation of an industry-ready workforce. Students not only learn the practical skills associated with a particular vocation or trade, but also collaboration, teamwork, work ethics and more. Apprenticeships make use of the latest physical and digital infrastructure available with industry and businesses, helping to overcome the shortage of adequately equipped training labs. Most countries around the world have implemented the apprenticeship model. According to a 2013 ILO report, Australia and Germany have large apprenticeship systems where 3.7% of the workforce avail apprenticeships, relative to small apprenticeship systems such as the USA where the figure is 0.3% of the workforce (ILO–WB, 2013). In India, the number of apprentices stood at a very low 0.28 million in 2019/20 (Department for International Development [DFID], 2020) out of a 492 million strong workforce (Periodic Labour Force Survey [PLFS], 2020), a mere 0.06%, small even relative to the USA.

The Apprentices Act was approved by the Parliament in 1961 with the aim of providing practical training facilities to unemployed engineers and holders of polytechnic diplomas, to help them find gainful employment in industry. The act was amended in 1973 to include the training of engineering graduates and diploma holders. Despite this, in-plant apprenticeship did not become integral to the course curriculum. Since then, the act has been amended several times, most recently in 2014. MSDE brought about comprehensive reforms through Apprenticeship Rules, 2015, making apprenticeship more industry friendly. In 2019, stipends were increased substantially, hiring limit of apprentices raised to 15% of the total strength of the organization from the previous 10%, and the size limit of organizations with mandatory apprenticeship obligations lowered from 40 to 30.

The National Apprenticeship Promotion Scheme (NAPS), launched in August 2016, is a GoI scheme that provides for basic training and practical or on-job training (OJT) at the workplace (NAPS, 2016). It incentivizes industry to engage apprentices in different sectors via an expenditure sharing model that partially covers both cost of training as well as stipend paid to trainees.

The scheme provides for:

- Reimbursement of 25% of prescribed stipend, subject to a maximum of Rs 1,500 per month per apprentice, to employers.
- Sharing of the cost of basic training of fresh apprentices (who come directly for apprenticeship training without formal training) limited to Rs 7,500 per apprentice, for a maximum duration of 500 hours or three months.

The scheme engages students from ITIs, polytechnics, schools, colleges and short-term courses such as PMKVY, DDU-GKY, and others. It was earlier restricted to only the manufacturing sector; but the government now sees more opportunity for engagement of apprentices in the service sector. The Directorate General of Training (DGT) implements the apprenticeships that fall under Designated Trades while the NSDC implements those under Optional Trades. Approximately 865,852 apprentices have registered for NAPS since launch[11].

The MSDE is also scaling up the Dual System Training (DST) scheme at ITIs, that provides industry exposure to students of the various ITIs through industry-led training. The scheme enables industries to partner with government and private ITIs for conducting training programmes in high-employability courses aimed at fulfilling industry needs. The ITIs and industry have the freedom to choose the training pattern. The theory portion, basics of safety, tools and equipment usage, along with foundation practical, is conducted at the ITIs, while the industrial training relevant to practical/ lab training component of the curriculum is taught in the industry. The students are paid a small stipend in their training period at the industry and are awarded NTC in dual mode upon successful completion of training. The MSDE and the MoE have also rolled out the Scheme for Higher Education Youth in Apprenticeship and Skills (SHREYAS), a programme[12] that embeds apprenticeships in retail, media, logistics and other sectors into degree programmes such as BA/BSc/BCom courses in higher educational institutions, as part of NAPS. The BVoc courses, launched by the University Grants Commission (UGC) in 2013, and other undergraduate degrees are also being encouraged to move towards apprenticeship-based training. The NEP too supports apprenticeships. All these moves will result in considerable improvement in the country's apprenticeship numbers.

[10] https://www.bmbf.de/en/the-german-vocational-training-system-2129.html

[11] https://apprenticeshipindia.org/

[12] https://pib.gov.in/Pressreleaseshare.aspx?PRID=1566528#:~:text=SHREYAS%20portal%20will%20enable%20educational,per%20pre%2Dspecified%20eligibility%20criteria.

State level initiatives

Above: Trainees learn how to program and operate a CNC machine at Learnet Skills. Okhla, New Delhi, India.

The State Skill Development Missions (SSDMs) are engaged primarily in implementing two categories of schemes run by the central government. The CSCM category schemes are run by the central government through its own staff, as a parallel effort to that of the state government, typically with better funding and resources. The CSSM category schemes are run by state governments as per guidelines issued by the central ministries, most often through the NSDC. There is considerable variation in the structure of the SSDMs in various states. For instance, Rajasthan has set up a Skill Development Society that is a non-profit organization, whereas Tamil Nadu has set up a corporation. Maharashtra has set up the Maharashtra State Skill Development Society (MSSDS) that focuses on employer-led models of skilling. Maharashtra has only thirty people to implement their skilling missions whereas Madhya Pradesh has thousands.

There are as many as thirty-two centrally sponsored schemes that are running in the states. Experience with these schemes shows that some fine tuning can help improve outcomes further. Design is critical to the success of the central schemes. They must build in adequate room for states to make adjustments to the schemes, keeping the special characteristics of the scheme, geography-related issues, and the preferences of the state governments in mind. For instance, the measure of success in a central scheme is generally placement and most schemes require 70% placement at the end of training. This needs to change if training in horticulture/agriculture is to be allowed as part of the central scheme since these courses lead to self-employment and don't need to have placement services associated with them. Similarly, government schemes target course-design based on NSQF levels but all employment in rural areas is in the informal sector and cannot easily be measured in these terms. Methods for better coordination between the central government and the states as well as their district level and Panchayati Raj Institutions (PRI) are also critical for the successful implementation of TVET programmes, particularly for learners from the NEET segment who come from rural areas.

FIGURE 4
Capacity building of states through the NSDC

Source: NSDC

NSDC is also engaged in assisting state governments to strengthen their SSDMs, through a States Technical Assistance team in Delhi that coordinates with individual State Engagement Officers (SEOs) and their teams in the twenty-six states and union territories (see Figure 4). NSDC provides several types of services to the SSDMs including access to technology platforms by extending the design of the platforms to accommodate the unique requirements of the states. For instance, access to Skill India Portal (SIP) has been provided to all SSDMs with effect from November 2019, along with integration of the MIS of several state governments into the portal. NSDC also supports the SSDMs in enrolling youth for various schemes, designing QPs for locally relevant traditional practices and art, and facilitating assessment and certification of students.

Special projects run by the state governments

SSDMs also design and run innovative schemes of their own. The Community Skill Parks (CSP) run by the higher education department of the Kerala Government as part of their Additional Skills Acquisition Programme (ASAP) is an interesting example. Set up in 2012, ASAP has been empowering the youth of Kerala through globally relevant employable skills in eighty-five trades across twenty-three sectors. It trains 30,000 students or more on a regular basis throughout the year and is one of the largest training agencies in the country.

The CSPs have been conceived by ASAP as multi-skills development centres equipped with state-of-the-art skill training facilities to be set up all over Kerala. They are world class training facilities with infrastructure of 25,000 to 30,000 sq ft that is built by the state government and handed over to industry partners to equip and run as operating partners of the government in a PPP mode. The courses proposed by the operating partners are cleared by the governing council and 30% of the seats are made available to ASAP at a concessional fee. Separate training spaces demarcated as heavy machinery, precision activity and IT quadrants allow for grouping of training programmes and ensures flexibility and ease in the operation of classrooms and labs. The CSPs are linked to nearby academic institutions in a hub and spoke model, with CSP as the hub. This innovative training space management model also enhances the capacity of each spoke and provides tremendous growth opportunities to both public and private academic and training facilities around each CSP. The CSP model provides key infrastructural support to academic institutions in their implementation of the NEP.

The One District One Product (ODOP) programme in Uttar Pradesh (UP) that aims to preserve, develop, and promote local crafts and skills is yet another example of an innovative scheme. Its aim is to help improve product quality and support skill development, leading to local employment, better incomes for artisans and consequently, a drop in the migration of people looking for work. UP has 75 districts and each district has been assigned a product that it has significant competitive advantage in, both in terms of manufacturing, and in the potential for finding national as well as global markets.

The design of the scheme caters to the entire ecosystem of each product – from raw material supplier to artisan to retailer and trader/exporter. The government has provided working capital loans to MSMEs and is setting up dedicated Common Facility Centres (CFCs) for each district's particular product. A CFC for processing the Geographical Indication (GI) tagged *Kalanamak* rice from Siddharthnagar, and one for creating a raw material bank of clay and processing facilities for Azamgarh's black pottery are two of many examples. Every product is also associated with a well-developed go-to-market strategy covering partnerships with private sector retailers such as Amazon and Flipkart, efforts towards better packaging and branding, creation of design studios for improving designs, technological upgradation of ODOP units, and quality councils for standardizing products. Banks have also been brought in to provide additional credit to artisans and self-help groups (SHGs), and the government is also collaborating with stock exchanges to consider taking ODOP units to the capital markets.

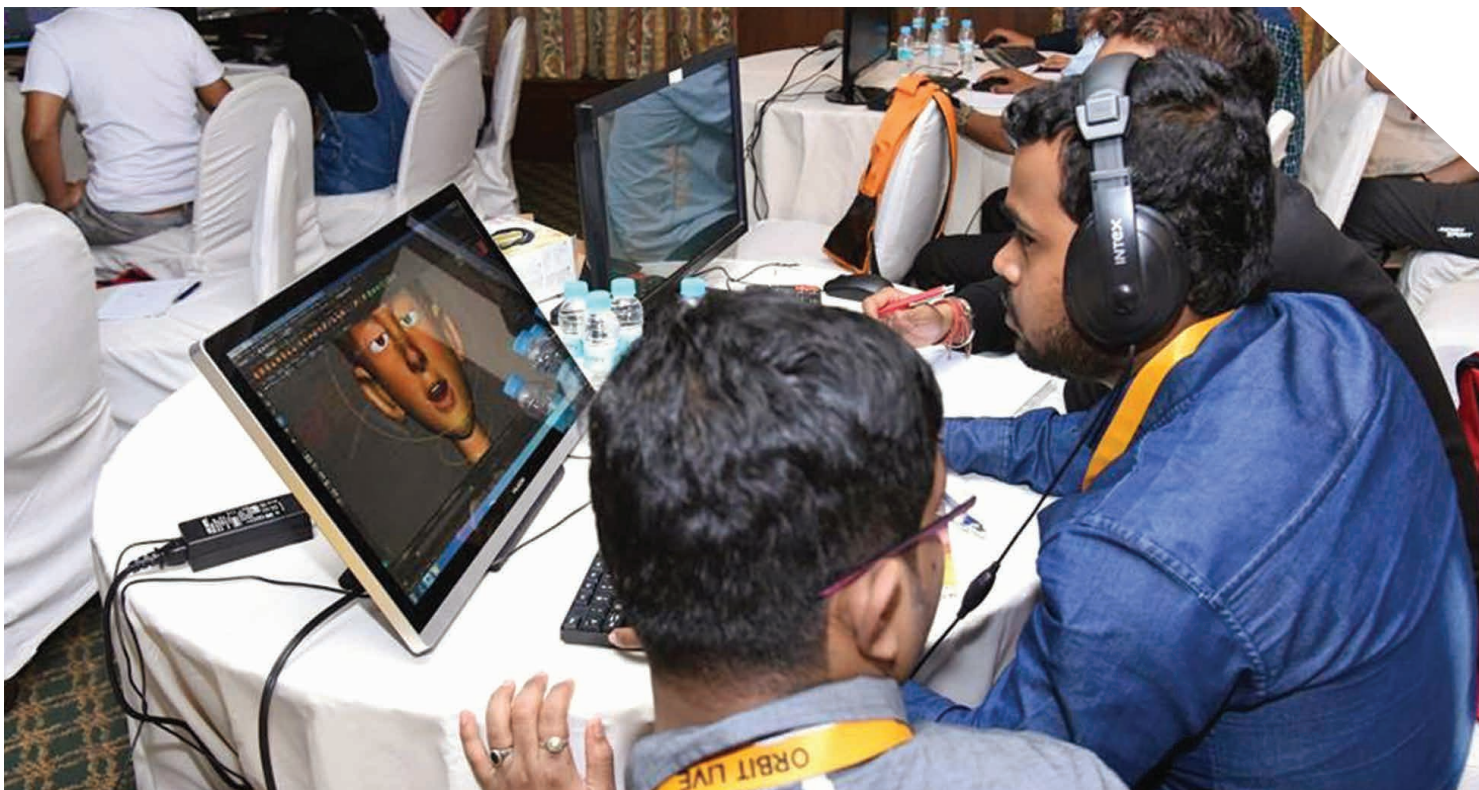
Employer-led models of TVET provision

Industry and business have multiple roles in the TVET ecosystem and are not just potential employers. They offer short-term and long-term apprenticeships and internships to students from educational and TVET institutions, and provide in-house training in both practical and theoretical aspects of TVET. Through their engagement with the SSCs, they also participate in defining NOSs and QPs and also in defining curriculum and standards for assessment of students. Many of the larger industries and industry bodies have been participating actively in training students, preparing a work force for themselves, and for others in their sector, for many years. However, in recent years such training has been done predominantly using funds earmarked for their Corporate Social Responsibility (CSR) efforts, as required by the Companies Act[13] of the Government of India, discussed in the following section.

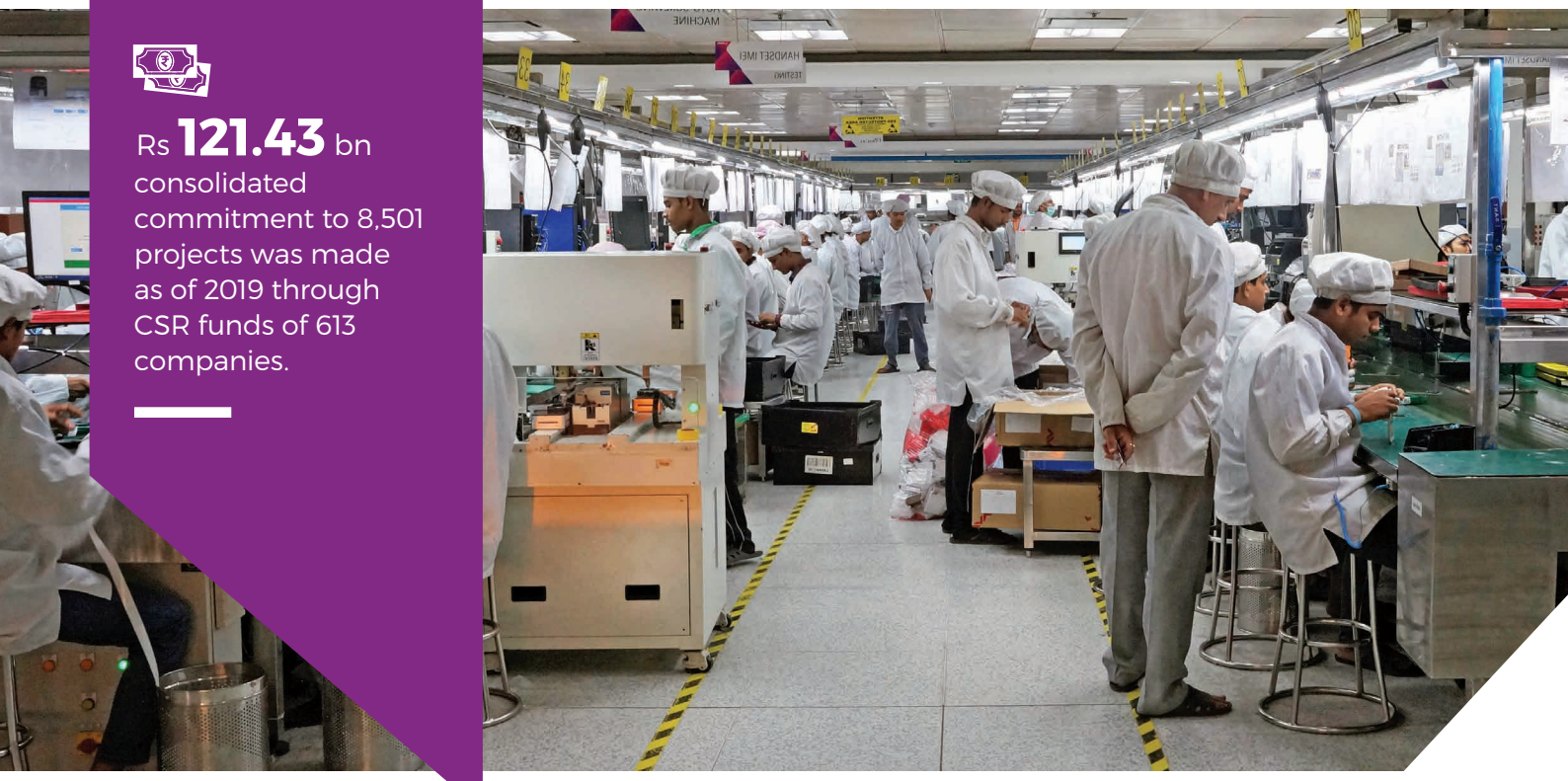
A 2018 report titled 'Employer led models for job creation' by the Federation of Indian Chambers of Commerce and Industry (FICCI) brings together the experiences of many industries and businesses in training and generating job opportunities in agriculture, manufacturing, services and even the social sector (FICCI, 2018). The report also highlights the new skill sets needed in select sectors and serves as an indication for the requirements of TVET going forward. There are several models under which private sector employers participate in provisioning TVET. A National Council of Applied Economic Research (NCAER) report offers a framework for skilling India through acquiring, matching and anticipating skills that can help break the vicious cycle of poor skilling and shortage of good jobs (NCAER, 2018). It cites some interesting examples of 'earn-while-you-learn' models.

Below: BVoc students of graphics and multimedia at TISS-SVE attend a workshop conducted by experts from Moving Picture Company, London. Mumbai, India.

[13] https://www.mca.gov.in/SearchableActs/Section135.htm



Rs **121.43** bn consolidated commitment to 8,501 projects was made as of 2019 through CSR funds of 613 companies.



Above: BVoc students of electronics at TISS undergo a training session in mobile phone manufacturing at Lava International Limited. Noida, Uttar Pradesh, India.

- A 12-month apprenticeship programme for engineering graduates with Bosch that provides OJT as well as classroom training.
- Three years of training in modern glass manufacturing skills with Saint Gobain, entailing one day of class followed by 5 days on the shop floor each week, and leading to a diploma.

The report also captures several other examples including the training of fresh graduates recruited from campus placements at Infosys over a period of three to four months.

TVET provision using Corporate Social Responsibility funds

As mentioned earlier, CSR efforts of various companies comprise some of the most successful models of TVET provision. A recent analysis conducted among 613 companies that contributed to skill development through CSR funds as of FY 2019 points out that a consolidated commitment of over Rs 121 billion have been committed to 8,501 projects across key sub-thematic areas of skilling infrastructure, urban livelihoods, digital skilling, rural livelihoods and PwD skilling (CSRBOX, 2020). In 2018/19, 328 companies contributed to projects in the skill development domain through CSR funding of over Rs 16.5 billion[14].

Some examples of successful TVET provision through CSR efforts follow.

LARSEN & TOUBRO

Larsen & Toubro (L&T) has set up Construction Skills Training Institutes (CSTIs) in Chennai and several other cities in the country and entered into a MoU with Henry Boot Training Ltd and the Construction Industry Training Board of UK for the development of modular training in many areas such as carpentry, masonry, plumbing and sanitary, electrical and others. The training tenures vary between 200 hours a month to 600 hours spread over three months, and consists of 80% practical training. Although the first CSTI was set up early as 1995, the initiative is now part of L&T's CSR efforts, and touches the lives of well over 500,000 trained personnel.

STATE BANK OF INDIA

The State Bank of India (SBI) Foundation is focused on skill development and livelihood and partners with various organizations to target different groups of people. With Centurion University, it provides healthcare sector OJT to individuals belonging to SC/ ST categories and women from the remote, rural and tribal regions of Odisha and adjoining eastern states, with a focus on backward and Left-Wing Extremist Affected (LWEA) districts. For targeting youth with disabilities, it has worked with the Youth4Jobs foundation and the Sarthak Educational Trust.

[14] https://ngobox.org/detail_resources_CSR-and-Skill-Development-Projects-in-India-(FY2019)_27

ICICI FOUNDATION

The ICICI foundation, launched in 2008, set up the ICICI Academy for Skills in 2013, to provide industry-relevant and job-oriented vocational training in 12 technical and office skills. In order to ensure that these courses are relevant to the industry, curriculum design and content development – including the setting up of labs and training of the trainers – is undertaken by the knowledge partners of ICICI. The academy provides placement assistance to trainees through industry partnerships and continue to achieve 100% placement for all their trained youth. Till date, there are 26 academies in the country that have collaborated with over 1,300 industry partners – including Eureka Forbes, Karvy Data Management Services, Apollo Hospitals, and others – to train over 140,000 candidates.

TATA STRIVE

Set up by the Tata Trusts on behalf of all the Tata group companies, Tata Strive is easily one of the largest CSR efforts. The initiative develops the skills of people from financially challenged backgrounds and prepares them for the changing world of work. The courses are designed for school dropouts, Secondary School Certificate (SSC) holders and Higher Secondary Certified candidates. The aim is to create and supply trained manpower across the entire industrial spectrum as well as develop entrepreneurial talent. Currently Tata Strive operates in twenty-five states and offers more than fifty short-term courses in twenty-five sectors. It has trained more than 150,000 students so far and successfully offered placement to a majority of them. Each course is delivered as a combination of theory and OJT training with a special emphasis on values, beliefs, emotions and self-confidence, which prepare the students well for their careers. Tata STRIVE actively partners with Tata companies, non-profits, non-Tata companies, government agencies, foundations, trusts, banks, NGOs, and even the ITIs who form a big component of the partnership model. These partnerships are built up in different ways, including scaling up the training capacity and capability of government, NGOs, and corporates.

Vocational education in schools and colleges

The need to integrate vocational education into school education has been long appreciated, dating back to Mahatma Gandhi and his pedagogic principle of Nai Talim, enunciated in 1937. The two earlier education policies (NPE 1968, NPE 1986) too had considerable emphasis on vocational education. The Eleventh Five Year Plan (2007–2012) document described the formal structure of the TVET provision landscape at the time:

- Technical training in specialized institutions such as technical schools, ITIs and polytechnics offering diplomas in various subjects.
- Vocational education in schools at the secondary and higher secondary levels.
- Apprenticeship training.
- Higher technical education imparted through professional colleges (engineering, medicine etc.).

The Twelfth Plan estimated that only 4.8% of higher secondary students were enrolled for vocational education against a target of 25% by the year 2000, set by the NPE 1986 (POA 1992).

Source: FYP 2015

Secondary and higher secondary Schools

As part of the implementation of NPE 1986, a scheme was started from 1993/94 that provided pre-vocational education at the lower secondary levels. The aim was to impart training in simple marketable skills, and to help develop vocational interests.

The Eleventh Five Year Plan (2007–2012) document observed that there were about 9,583 schools offering about 150 educational courses of two years duration at the higher secondary levels (Grades 11–12), and covering about a million students. Courses offered were in the broad areas of agriculture, business and commerce, engineering and technology, health and paramedical, home science, and science and technology. The plan set a target of expanding the number of schools to 20,000 with an intake of 2.5 million students. Unfortunately, the numbers have not changed a great deal despite the passage of more than a decade – 10,158 state government schools (see Page 25, Table 1) and 8,583 CBSE schools that cover a total of 1.2 million students. The progress has been in the content of the courses, which have been re-oriented towards better employability as per NOS, QPs

and NSQF guidelines. The Twelfth Five Year Plan (2012–2017) estimated that only about 4.8% of higher secondary school students (Grades 11–12) were enrolled for vocational education, against a target of 25% by the year 2000 set by the implementation plan of NPE 1986 (POA 1992). The Plan pointed out that in countries such as South Korea and Australia, 25% to 40% of high school students opt for vocational courses, making them job-ready once they complete Grade 12. Vocational education for students in Grades 9–12 became an option only in 2014, post the adoption of the NSQF.

The provisions for vertical progression into higher education is a critical part of making vocational education aspirational for students and for increasing its acceptance. Some states have taken important steps in this regard. The list includes:

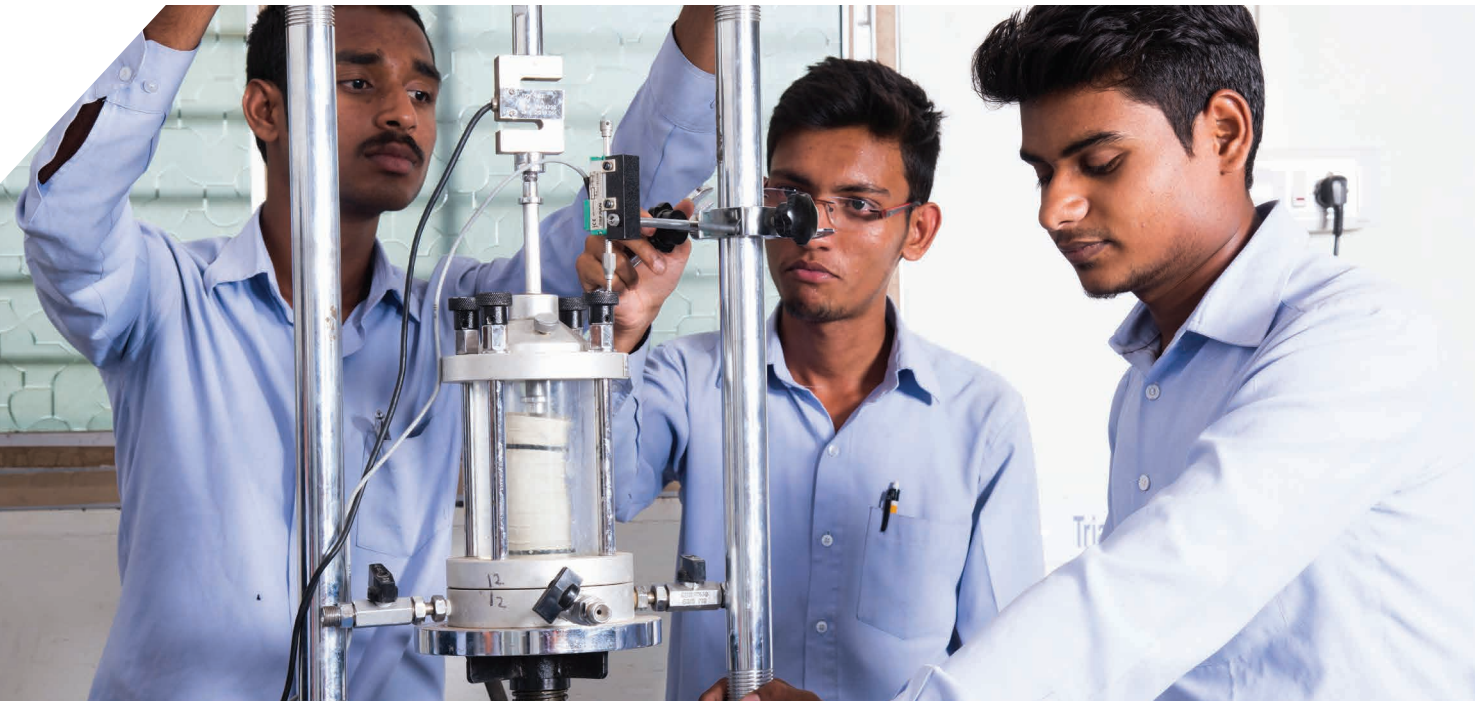
- Haryana where vocational students can get direct admission into the second year of diploma courses.
- Maharashtra which has a reservation in ITIs and Polytechnics for vocational students passing Grade 10.
- Himachal Pradesh which gives extra weightage to vocational education students passing Grade 12 for admission into the BVoc courses.

More states need to come forward and adopt similar measures, including offering of admission into regular Bachelors' and Masters' degree programmes, with suitable bridge courses if necessary.

The vocational courses under the 'Samagra Shiksha Abhiyan' are NSQF compliant and available to students in Grades 9–12 (Samagra 2019). In Grades 9 and 10, vocational modules are offered as an additional sixth subject whereas at the higher secondary level, Grades 11–12, vocational courses are offered as a compulsory (elective) subject. Under the scheme, the vocational courses offered in school are based on job roles that have been approved by the NSQC. PSSCIVE develops the curriculum and courseware in consultation with the SSCs, on the basis of notional hours, age and educational qualification prescribed, and suitability for school students. A module on employability skills has been made a mandatory part of these vocational courses. The course content covers material on communication skills, self-management skills, Information and Communication Technology (ICT) skills, entrepreneurship skills and green skills. Students are assessed by the SSCs and provided with certification that enables them to seek jobs.

Samagra Shiksha Abhiyan also includes a multi-skilling course that provides vocational exposure to students in secondary school so that they can be oriented to the skills required for various occupations, and are able to make informed choices when selecting subjects in higher grades. The state of Maharashtra has been offering such a course –'Introduction to Basic Technology,' developed at Vigyan Ashram[15] in Pabal, Pune – since as early as 1987. The course was offered to students in Grades 8 to 10 in 122 schools once a week. The popularity and utility of such courses are now well understood. The course is currently running in 600 schools, touching the lives of 40,000 students in the state via the Lend-A-Hand India Foundation, an NGO that supports schools in running these courses (see Case Study 1). The introduction of such courses in the Samagra Shiksha Abhiyan will help scale courses up to thousands of schools reaching millions of students.

[15] http://vigyanashram.com/InnerPages/Milestones.aspx



Below: Group work in college engineering laboratory. Nagpur, Maharashtra, India.

CASE STUDY 1

Lend-A-Hand India Foundation

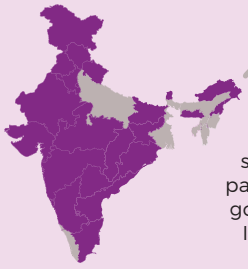
Lend-A-Hand India (LAHI) Foundation works closely with as many as twenty-four state governments. Its partners include departments of education and local bodies such as the municipal corporations in each state, the Department of Skill Development and Entrepreneurship in Maharashtra and funding partners listed on their website https://www.lend-a-hand-india.org/partners.php

Their project catalyst provides critical technical and programme management support to state government departments and agencies in offering vocational education as part of mainstream education. Qualified staff member(s) from LAHI are included in the programme implementation team at the state level to help with programme management.

and higher secondary schemes of the MoE. Through these state government partnerships, it reaches over 10,000+ schools and more than a million adolescent students.

LAHI's journey started in 2006/07 with the introduction of a multi-skill vocational education programme called the 'Multi Skill Foundation Course' for students in the 14–18 age group at 2 schools. The programme now reaches over 11,900 students annually at over 150 schools, with proven results demonstrated by an independent impact assessment. The year 2014 became a major milestone when a vocational subject was made a core subject (100 marks out of 600 marks) of the curriculum in Maharashtra. From 2018, internships with small and micro enterprises during Grades 11–12

CURRENT REACH



24
states/ UTs through PPP partnership, between state government, Lend a Hand India and private sector

10,000
schools managed by 220 staff members

1,000,000
students, skill trained by 20,000 vocational trainers

LAHI has focused on the integration of vocational education with existing school curricula for students of Grades 9–12, supplemented with internship at small and micro enterprises during Grades 11–12, making school education practical and relevant, and facilitating the school-to-work transition. LAHI provides catalytic technical and project management support to the office of the Samagra Shiksha Abhiyan in each participating state, at no cost to the government, in order to implement the vocationalization of secondary

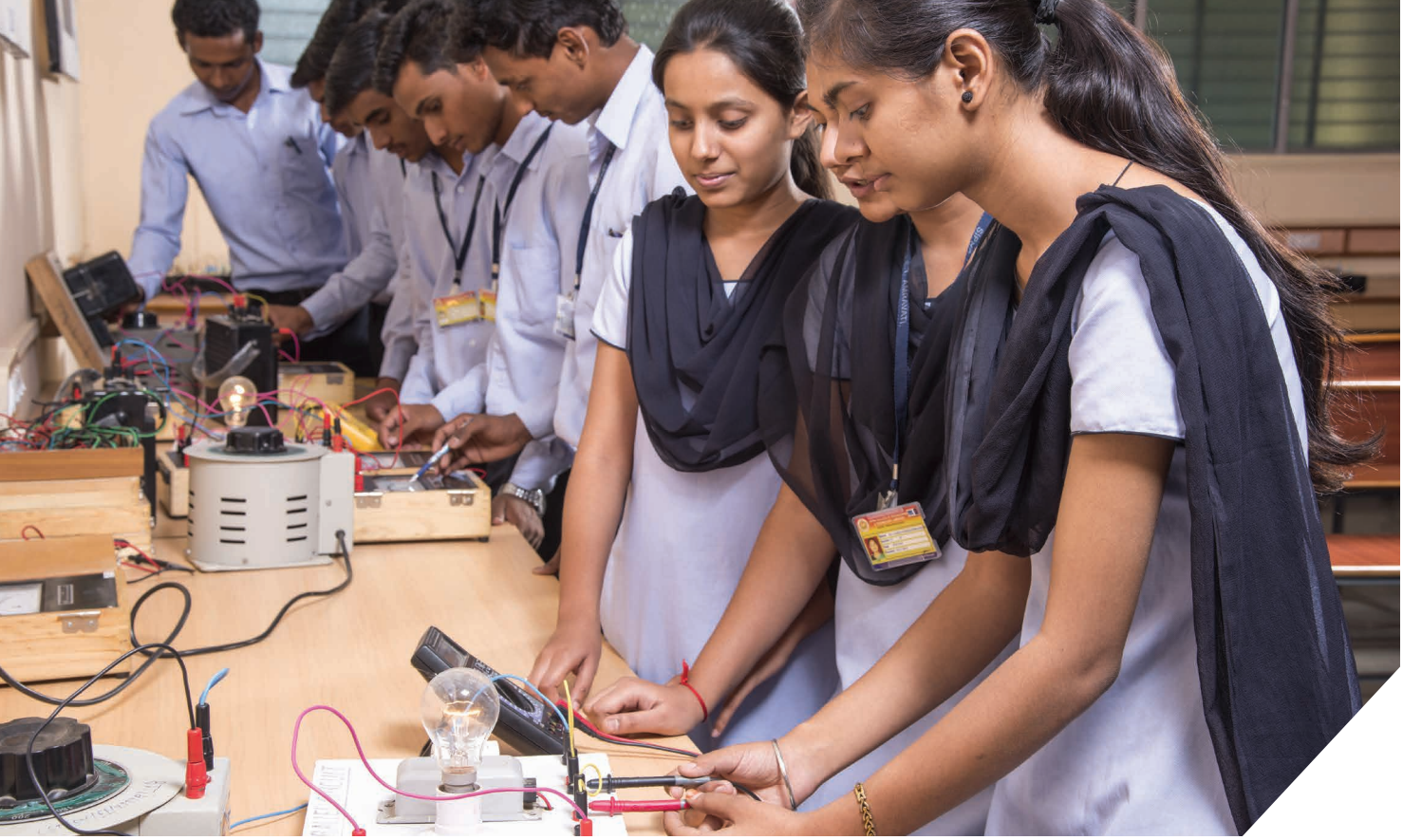
MULTI SKILL CURRICULUM PROVIDES INTRODUCTION TO THE WORLD OF WORK

TECHNICAL SKILLS	Workshop & Engineering Techniques	Energy & Environment
LIFE SCIENCE SKILLS	Food Processing Techniques	Gardening, Nursery & Agriculture Techniques

were made part of the curriculum, bringing students much closer to the real 'world of work'. The results were very encouraging in terms of placements and triggered entrepreneurial ambitions within students at a young age. An impact analysis showed that after being exposed to internships in this way, 90% of students said that they were better aware of the requirements of the job they wanted to pursue. The analysis also showed that LAHI students were three times more likely to be employed, self-employed, and to pursue technical education relative to non-LAHI students.

Lend A Hand India has also implemented a unique 3-way PPP model in which LAHI delivers technical and domain expertise in skill education, funded by private capital and backed by the policymaking power of central and state governments. For instance, its partnership with the government of Delhi is supported by the JPMorgan Chase Foundation.

Source: Special write-up by Mr Raj Gilda, Lend-A-Hand India Foundation.



Above: Students of electronic engineering conducting laboratory tests. Nagpur, Maharashtra, India.

Multi-skilling courses have proved to be a very good way to introduce children to different sectors of the economy – agriculture, IT and ITeS, Healthcare, Banking Financial Services and Insurance (BFSI) and so on (see Case Study 1). The difficulty in the present implementation of Samagra Shiksha Abhiyan appears to lie in assessment of students as there are multiple SSCs involved in the evaluation of a single course. However, with the NEP 2020 advocating inclusion of multi-skilling courses in earlier grades (Grades 6–8), the course content can be blended into the curriculum through the new NCFSE, and the evaluation of such courses can be done within the school, preferably in the pass/fail mode. Approximately between 100 and 120 schools across Kerala are already offering vocational education starting from Grade 6.

Colleges and the new skill universities

The UGC first launched a vocational education scheme in 1994/95, primarily to enhance the employability of graduates, but with a focus also on self-employment, and on improving the productivity of household occupations. Students were expected to select at least one vocational subject during their undergraduate programme. Curriculum was worked out in 35 subjects in 4 streams – arts, science, commerce, engineering and technology – but institutions also had the freedom to introduce other courses. Students were also exposed to a short course on entrepreneurship, so in fact the scheme was well thought-out. However, it did not succeed due to deficiencies in implementation.

UGC went on to issue guidelines for BVoc programmes in 2013 and funded an initial 127 colleges to run these courses on a pilot basis (UGC, 2013). The number of colleges offering these programmes has since grown to nearly a thousand[16]. Preliminary experience with these BVoc courses shows that institutions have had mixed success and some have even closed down the programme (Wadia, 2019b). This is because many colleges attempted to run these BVoc courses in the traditional way by hiring local faculty and setting up labs within the college premises, using the preliminary grants given by UGC. However, since no further grants were forthcoming from the UGC, colleges found it difficult to continue to pay their teachers and keep running the courses. In this context, Tata Institute of Social Sciences (TISS) in Mumbai threw up an extremely successful model for offering BVoc programmes at scale. The School of Vocational Education (SVE) at TISS overcame the difficulties faced by other colleges by designing an innovative public-private partnership (PPP) model involving multiple partners from industry who came together to bring their unique strengths to the table (see Case Study 2). The innovation of TISS–SVE is not restricted only to the academic course delivery model, but extends to the financial model – involving revenue sharing with partners – and the administrative model that uses an ERP system, ensuring all partners adhere to their commitments and receive payments only against completed tasks (Wadia, 2019).

[16] https://www.ugc.ac.in/pdfnews/3986236_NSQF-999-newly-approved-institutions.pdf

CASE STUDY 2

Tata Institute of Social Sciences - School of Vocational Education (TISS-SVE)

The Tata Institute of Social Sciences (TISS) is a premier institute of social work in India. It was established in 1936 and recognized as a deemed university by the UGC in 1964. TISS has campuses in Mumbai, Hyderabad, Tuljapur and Guwahati.

The model of vocational education developed by the School of Vocational Education at TISS is a partnership-based model consisting of three types of partners. The vertical anchors (VAs) are experts in various sectors of the economy, and they assist TISS-SVE in designing courses. The skill knowledge providers (SKPs) are industry partners who provide apprenticeships to students. The learning hubs are partners in different cities around the country who mobilize students for the courses and find apprenticeships for them.

TISS-SVE offers 29 different BVoc courses in 18 sectors of the economy, 30 post-graduate diploma courses and many short-term certificate courses. It uses a custom ERP system to manage the entire student life cycle as well as the relationships with all its partners. All aspects of the student life cycle – enrolment, fee collection, oversight of training, counselling sessions, conduct of examinations and certification – are tracked to ensure quality outcomes.

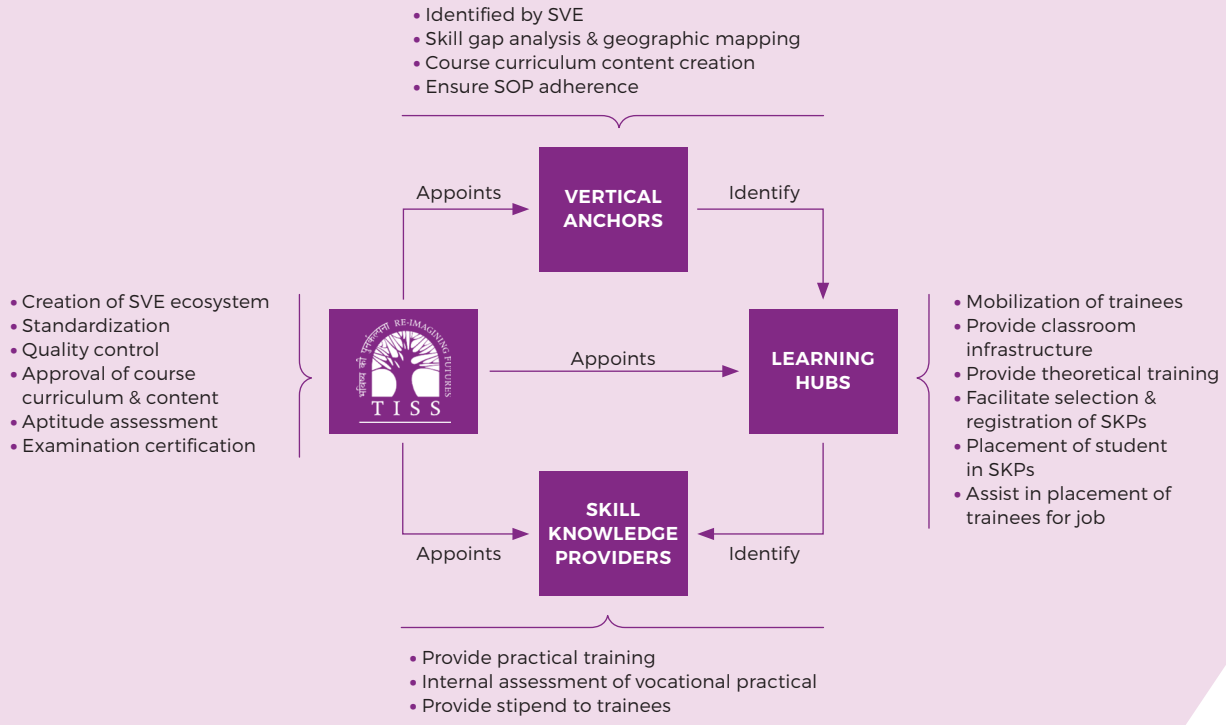
The courses are kept affordable for students, costing between INR 2000 and INR 4000 per month, and most students are able to cover this from the stipends that they receive during their apprenticeships. The income from the fee is shared generously with the VAs and the hubs, making the model attractive to them. The robust design of the collaboration model and the use of the ERP ensures that the model is scalable, and replicable. More details of the model is available at https://www.orfonline.org/research/scaling-vocational-education-case-study-tiss-sve/

11,500
students in BVoc courses

3,500+
students in PG Diploma and Diploma courses

The best indication of value being provided is the steep growth in student enrolment, from an intake of just 443 in 2014 to 6,145 in 2019 in the BVoc programmes. Since students spend 5 days a week at the SKPs, they have three years of work experience at graduation. The placement rate is 80%.

The students who do not opt for placements go for higher education or join a family business. The students who receive placement usually draw a salary in the range of Rs 10,000 to Rs 30,000 per month.



Source: Documentation provided by the School of Vocational Education at TISS

The SHREYAS programme described on Page 56 embeds apprenticeships in regular undergraduate courses in order to prepare students for the world of work. Another such model that seeks to make students from existing undergraduate programmes more employable is the National University Students' Skill Development[17] (NUSSD) programme, also developed at TISS, Mumbai. The NUSSD programme supplements the education of regular BA, BSc and BCom students by providing them with an additional diploma from TISS along with their regular college degrees. The diploma includes courses in soft skills as well as vocational education in one domain. The theory courses are run parallel to the regular degree while internships take place during summer. Students complete the required credits within three summers and qualify for the additional diploma. It has been observed that students placed in this programme have seen a much higher level of placement than regular graduates. Other successful models include the integrated BVoc programmes being offered by Dayalbagh Educational Institute (DEI), a deemed university. DEI offers an excellent model for the complete integration of vocational education into many disciplines taught at the university, as envisioned by the NEP (see Case Study 3).

CASE STUDY 3

Dayalbagh Educational Institute

Dayalbagh Educational Institute (DEI) in Agra has been successful in integrating vocational education into all stages of education through a beautiful synergetic relationship between the community and academia, which began as early as 1915. DEI has facilities to offer education from pre-nursery to Ph.D. Appropriate skilling activities are designed to inculcate systems-thinking and design-thinking at every stage.

In the primary stage, children have the opportunity to explore different arts, crafts and cultural activities in the children's recreation centre. Students in the middle school – in Grades 6 to 8 – participate in tinkering labs and explore their interests through well-structured tinkering activities. By the time they enter Grade 8, those students who have an aptitude for skilling can exit into pure skills pathways such as technical education. At the secondary level, both the Girls and Boys Higher Secondary Schools of DEI have been granted Atal Tinkering Labs.

At the higher education level, DEI has a focus on physical, mental, and spiritual development of students as one of the objectives. The vocational/ skilling/ work-based experience is incorporated into the curriculum also in non-vocational degree programmes. DEI has a DDU Kaushal Kendra under the UGC scheme and offers BVoc, MVoc and PhD programmes. There are as many as 21 BVoc courses in topics ranging from AI & Robotics, green house technology, ceramics and pottery, to water, sanitation and waste management. Practical training is provided through a concept called 'Lab on land'. For instance, the institute has a 1MW solar power plant, which acts as a living lab for the students of renewable energy where students get training for installation and maintenance. The BVoc programme in dairy technology collaborates with the community owned dairy farm that has 1,200 milking cattle, which acts as a living lab for the dairy maintenance. A HACCP and FSSAI certified mini dairy plant has been set up to process approximately 500 litres of milk from the dairy farm. Students prepare milk products that are sold on campus giving them a sense of the market response. Students are also given training on the export of milk products including licensing needs.

Almost all the BVoc programmes at DEI are associated with a living lab. Students of the BVoc programme on food processing run the on-campus canteen and manage the entire chain from procurement to marketing. Students of apparel design stitch uniforms for their fellow students. All these curriculum-integrated trade-specific hands-on practices provide opportunities to students to understand the nuances of entrepreneurship and start-ups. Students also get an opportunity to work part-time and earn some money during their studies, which is useful to those from economically disadvantaged backgrounds. These include working at the living labs of the institute such as the solar power plants, dairy plant, surveillance network, optical fibre network, WiFi network, waste disposal centre, library, computer centre, and security among others.

DEI has started sharing their knowledge and experience by partnering with the SSDMs in Maharashtra, Madhya Pradesh and Rajasthan. The DEI model of vocational education is an integrated model that already embodies the features targeted by NEP 2020.

Source: Documentation provided by Dr Prem Kalra and Dr Mugdha Sharma, DEI, and https://www.dei.ac.in/dei/files/aboutDEI/DEI-Systems-Approach.pdf

[17] https://www.tiss.edu/view/11/projects/nussd-skill-development/

Several state governments have also set up skill universities to give out different types of undergraduate degrees in TVET, and many of them provide integrated education through BTech, BCom and BSc degrees instead of BVoc in order to make their programmes more acceptable to students. The skill universities have been set up by each state government typically as a state public university.

For instance, the Shri Vishwakarma Skill University has been set up in Haryana at a projected cost of Rs 9 billion, However, given the provisions of the NEP 2020 that encourages existing colleges and universities to offer TVET programmes, and allows all autonomous institutions to grant their own degrees, there is no real need to setup new skill universities in the future.

Strengthening the TVET planning and delivery ecosystem: the SANKALP project

The SANKALP programme takes planning and governance of TVET down to the district level through reviving the District Skilling Committees.

Skills Acquisition and Knowledge Awareness for Livelihood Promotion (SANKALP) is a strategic reform programme supported by the World Bank, and conceived to support the National Skill Development Mission of the MSDE[18]. Disbursements are pinned to outcomes in four key result areas:

- Institutional strengthening at the central, state and district level.
- Quality assurance of skill development programmes.
- Inclusion of marginalized population in skill development programmes.
- Expanding skills through PPPs.

The aim of SANKALP is to tackle issues in improving the quality of the TVET ecosystem, by enabling management information systems and via capacity building of personnel engaged in TVET provision - government officials tasked with delivering/ monitoring programmes, trainers, institutions, and personnel involved in the development of curriculum and education material.

The SANKALP programme addresses a major challenge in skill development – a disconnect from local realities at the planning stage – by taking planning and governance down to the district level. It does so by reviving the District Skilling Committees (DSCs), that may have existed in many states but have remained dormant. The DSCs are headed by the District Magistrate (DM) and consist of the district officers from various departments – such as education, industry, labour, social welfare, tribal welfare, and minorities – and industry representatives. The principal of an ITI or any other institute that will provide infrastructure support to the committee is also a member. The aim is to prepare a District Skill Development Plan (DSDP) by conducting a skill gap analysis within the district in order to identify the occupations for which training needs to be provided.

Another innovative aspect of the SANKALP programme is the introduction of the Mahatma Gandhi National Fellows (MGNF) programme across seventy-five districts in six states. MGNF is a two-year academic programme with the Indian Institute of Management Bangalore (IIMB) as the academic partner. The first batch of seventy-five young professionals have begun their training at IIMB. The course will consist of academic modules and district immersion modules interspersed with each other. The fellows will be deputed to seventy-five districts to support the district officials in activities such as district level planning, monitoring of activities related to skilling, management of data/information, coordination among different stakeholders in districts, and assistance to the DSC. They will have the opportunity to study and understand the challenges of skill development at the district level and evolve innovative solutions. Although the pandemic has interrupted deployment, it is evident that in the longer term, this programme can contribute substantially to strengthening the DSC ecosystem.

The SSDMs are expected to involve the fellows in planning, implementing, monitoring of plans and execution of various initiatives, and the district magistrate is expected to facilitate their work. The SSDMs are also responsible for monitoring and evaluation of the work done by the fellows and to support the innovative initiatives taken by them. There is therefore also a need to create a leadership and skill development programme for the first-level supervisory and managerial cadre, responsible for operational and tactical planning of skill development initiatives at the district level. Such a training programme would help strengthen the institutional leadership and capacity of members of the DSC to understand demand and supply, market dynamics and so on so that they can develop a holistic plan of action for their districts and be able to implement it.

Launched under SANKALP, the Skill India Portal aims to strengthen decision-making and increase transparency by making available all data related to skilling schemes of the central government, states and UTs.

[18] http://www.msde.gov.in/schemes-initiatives/Other-Schemes-and-Initiatives/SANKALP

Above: Practical training at a warehouse, India.

Summary

The Ministry of Skill Development and Entrepreneurship is the nodal ministry for skill development initiatives, responsible for coordination among the twenty-one government ministries that are engaged in the provision of TVET. The NSDC with its partner ecosystem has created an end-to-end infrastructure to identify youth interested in a particular occupation, training, assessing and certifying them, and finding placement. As a result, a useful convergence is now building up, with several ministries leaning towards the NSDC ecosystem for their training requirements.

The National Skills Qualification Framework adopted by India comprises ten levels, each defined by five parameters. The levels represent increasing complexity in terms of knowledge, competence and autonomy that is to be demonstrated by the learner. The National Occupational Standards (NOS) on the other hand, specify the standard of performance required when carrying out a function in the workplace, as well as the knowledge and understanding that the student must have in order to meet the standard consistently. Each NOS defines one key function in a job role, and a Qualification Pack (QP) is a set of NOSs aligned to a job role. The bulk of the QPs are NSQF aligned courses but the process of alignment is incomplete and not without problems.

Presently there are 14,782 ITIs – of which 2,200 are run by the government – that offer one to three year courses, and also courses leading to diplomas, with an intake capacity of approximately 2.39 million. The MSDE's dual system of training seeks to improve the employability of graduates through the introduction of apprenticeships. Polytechnics provide long-term technical education to students who have completed Grade 10 leading to a three-year diploma in various branches of engineering. Presently there are 3,440 standalone polytechnics, with an intake capacity of 1.51 million students.

Implemented by NSDC and its partners, the Pradhan Mantri Kaushal Vikas Yojana (PMKVY) II scheme consists of three parts – short-term training (STT), recognition of prior learning (RPL); and special projects. STT targets candidates who are either school/college dropouts or unemployed. Third party evaluation of the STT and the RPL components show that both have resulted in considerable benefits to recipients. The scheme has successfully achieved its target of benefiting 10 million youth over a period of four years.

The relatively new National Apprenticeship Promotion Scheme (NAPS) from the Government of India (GoI) incentivizes industry to engage apprentices in different sectors. The scheme engages students from ITIs, polytechnics, schools, colleges and short-term courses such as PMKVY, Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY), and others. The scheme was earlier restricted to the manufacturing sector only, but the government now sees more opportunity for apprenticeship in the services sector. Approximately 865,852 apprentices have registered for NAPS since launch.

State governments are engaged primarily in implementing central government schemes through their respective State Skill Development Missions (SSDMs), but they also design and run innovative schemes of their own. For example, the Community Skill Parks run by the Kerala government's Department of Higher Education are part of their Additional Skills Acquisition Programme and train over 30,000 students each year. Another innovative scheme is the One District One Product programme in Uttar Pradesh that aims to preserve, develop, and promote local crafts/skills. Each of the state's 75 districts has been assigned a product that it has a significant competitive advantage in, both in terms of manufacturing and in market potential, globally and nationally.

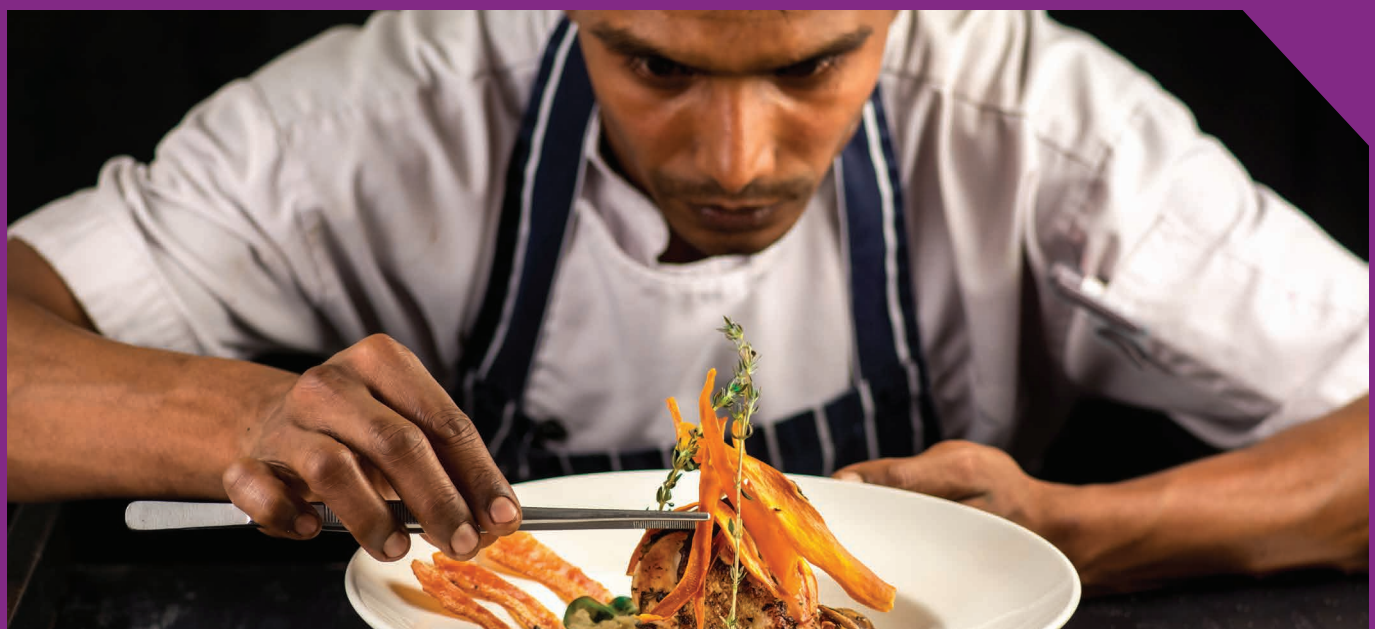
The CSR efforts of various companies constitute some of the most successful models of TVET provision. A recent analysis was conducted among 613 companies that contributed to skill development through CSR funds in FY 2019. It showed a consolidated commitment of over Rs 121 billion towards 8,501 projects. These cover key sub-thematic areas of skilling infrastructure, urban livelihoods, rural livelihoods as well as digital and PwD skilling. In 2018/19, 328 companies had contributed to projects in the skill development domain through CSR funding of over Rs 16.5 billion.

'Samagra Shiksha Abhiyan' offers NSQF-compliant courses to students in Grades 9–12. Vocational modules are offered as an additional sixth subject in Grades 9 and 10, and as a compulsory (elective) subject in Grades 11–12, or the higher secondary level. PSSCIVE develops the curriculum and courseware in consultation with the SSCs and include a mandatory module on employability skills. Students are assessed by the SSCs and provided with certification that enables them to seek jobs. Samagra Shiksha Abhiyan also includes a multi-skilling course that exposes students to various vocations. This course can be a template for others that will be needed during the implementation of the NEP 2020.

The BVoc programmes in higher education, introduced by the UGC in 2014 and funded at an initial 127 colleges, are now being offered at more than 1,000 colleges. Colleges attempting to run these programmes the regular way – by hiring local faculty and setting up labs within the premises – are seeing less success than innovative, apprenticeship-based, models involving public-private partnerships of the kind introduced by the Tata Institute of Social Sciences (TISS) in Mumbai.

Skills Acquisition and Knowledge Awareness for Livelihood Promotion (SANKALP) programme is supported by the World Bank and was conceived to aid the National Skill Development Mission of the MSDE. Its aim is to tackle issues in improving the quality of the TVET ecosystem by enabling management information systems and via capacity building of personnel engaged in TVET provision. They include government officials tasked with delivering/monitoring programmes, trainers, institutions, and personnel involved in the development of curriculum and education material.

Below: Trainee chef learning to plate food, India.



LIFELONG LEARNING

Inclusion and lifelong learning for hearing-impaired beneficiaries. A trainer uses sign language to teach computers at the American India Foundation's Ability Based Livelihood Empowerment (ABLE) skilling programme. Bengaluru, Karnataka, India.

CHAPTER 5

Challenges

This chapter assesses the experience of TVET provision so far, and identifies the challenges to its expansion from the perspective of key stakeholders such as students, trainers, parents, training providers, and governments.

5 Challenges

Quality and relevance of TVET courses

This section summarizes the lessons learnt – what has worked and what has not – from both short-term and long-term courses, as well as the vocational education programmes being provided by schools and colleges.

Assessment of short-term training courses

Many of the short-term training (STT) courses that are running at present are entry-level. They are relatively narrow in scope and prepare students for only one job role that they will grow out of very quickly. The target group for such training – particularly courses that are paid for by government schemes such as the Pradhan Mantri Kaushal Vikas Yojana (PMKVY) II and free to students – are youth and adults who have dropped out of school, have not completed secondary school (Grades 9 to 12), and are from the 'not in education, employment, or training' (NEET) segment. That these courses have not really succeeded is evident from their placement rates – well below 50% (see Table 4). In other words, every second person that the National Skill Development Corporation (NSDC) training partners have mobilized for these courses have not benefited from their training, which is a considerable waste of effort and resources. There are several reasons for this, including the fact that the courses are much too short in length and do not provide adequate orientation to the student, either to the job role or to the world of work. Many of the students mobilized are first-generation learners (FGLs) who require not just hands-on training in a particular job/trade, but a more holistic education – aligned with an appropriate NSQF level – that covers not only domain knowledge but also generic skills such as communication and interpersonal skills.

Below: A vision technician trainee learns to conduct a basic eye test at the Pradhan Mantri Kaushal Kendra. New Delhi, India.

CASE STUDY 4

Rustomjee Academy for Global Careers

With campuses in Maharashtra, Karnataka and Uttarakhand, RAGC conducts short-term programmes twelve to eighteen months in duration for automotive mechanics, multi-skilled technicians and construction site supervisors. It emphasizes practical sessions that account for 70% of the course duration. To complement such classroom and lab learning, there are field visits and expert sessions followed by a paid internship of seven to nine months. Such interactions keep learners connected to the industry during the entire course of the learning programme. RAGC's approach to vocational education is captured below:

OUR APPROACH

Setting up training centres

Mobilizing candidates as per the project criteria

Counselling about training and associated benefits

Training based on NSDC approved curriculum with pre-planned day-to-day sessions

On the job training because we emphasize on hands-on training over theoretical training

Placement within the existing pool of multi-sectoral industrial network

Hand-holding to ensure that we are a part of the growth journey of the beneficiaries

RAGC also conducts diploma level courses affiliated to Maharashtra State board of Vocational Education and Examination (MSBVEE) for positions such as auto engineering technician, electrical engineering, hotel operations & construction site supervisor. The diploma programme offered through MSBVEE is equivalent to the HSC and is considered to be an alternate qualification to the ITI courses.

In line with its vision of creating an army of employable skilled workers, RAGC has designed and developed a dynamic teaching methodology weaving in unique and crucial aspects such as 70:30 practical to theory ratio, industry visits, industry expert sessions and most importantly, industry internship with focused learning guidelines. Further, to foster a spirit of competition among learners, they are encouraged to participate in national and international competitions of repute, including the prestigious WorldSkills Competition. This ensures that learners are exposed to changing industry trends and dynamics, transforming them into a competitive industry-ready workforce. Additionally, in order to ensure that the learner does not restrict his or her future only to employment, and to encourage self-employment and entrepreneurship, RAGC has incorporated entrepreneurship training as a part of the curriculum across all its programmes. This gives students the opportunity to leverage their skills for becoming an entrepreneur, raising their social status, fuelling employment creation leading to economic development.

RAGC is the first institute of its kind to launch a five-year integrated programme in the fields of automotive, construction, electrical, business & hospitality studies. Strategically termed the ALPHA (Advanced Learning Platform for Higher Achievements) degree, it's divided into an initial two-year diploma followed by a three-year degree programme. Students of HSC or other boards can gain lateral entry to the degree programme that is interleaved with a compulsory industry internship of 2 years. This combination of theory and practical application gives students an opportunity to learn the whys and hows, leading to a holistic understanding of subjects and completes the learning curve. The two-year internship experience also leads to an assured job placement.

RAGC started as a philanthropic effort but has evolved into making use of funding from other sources such as government, CSR funds of its own and of other companies, fees and so on.

Source: Special write-up by Mr Kavi Luthra, RAGC

The value of thoughtfully designed training courses, that keep the long-term growth and development of young recipients in mind, cannot be overstated. Outcomes have been far superior when courses are conceived keeping in mind the training needs and profiles of FGLs from socially and economically disadvantaged backgrounds, as in the case of Rustomjee Academy for Global Careers (see Case Study 4). Businesses in general may not necessarily want 'job-ready' youth but they do need them to have life skills that enable them to learn continuously and apply their learning (ISR, 2020). This needs to be understood while designing training programmes. It is also important to bear in mind that not all youth have an aptitude for entrepreneurship. It is therefore necessary to build on their basic skills and prepare them for self-employment instead, given that sufficient numbers of jobs are unlikely to be available.

CASE STUDY 5

McKinsey Generation Project – mobilizing students for TVET courses on the basis of their aspirations

Launched in 2015, McKinsey's Generation Project seeks to close the skills gap for young people in 150 cities around the world. McKinsey's work demonstrates how paying attention to the aspirations of students is important, and how mobilization of students can be made to work better than it is doing now.

The paradox of global youth unemployment is that on the supply side, 75 million people are unemployed and three times more are underemployed, while on the demand side, 40% of employers say that a skill shortage is driving entry-level vacancies.

150
cities spanning thirteen countries with 360+ sites

37,000+
graduates (55% female) and 3,200+ employer partners with an 80% job placement rate and a ~70% continued employment rate at one year

2-6x
increase in student income immediately following Generation, with cumulative salaries of $300M+

84%
of Generation graduates outperform their peers on the job in productivity and quality outcomes

Active in 150 cities in 14 countries, the Generation Project has trained and placed more than 37,000 graduates (55% female), at an 80% job placement rate, and 70% continued employment rate after one year. Students have seen two to six times wage increases and 84% graduates have outperformed their peers in productivity and quality outcomes.

Source: McKinsey Generation Project Reports, Mr Rajat Khawas

The Generation methodology consists of the following seven steps:

1. Engage with employers and jobs from the start: Employers' inputs are used to upgrade the curriculum of NSDC training partners to include domain training as well as behavioural traits that are key differentiators.
2. Recruit students based on activity mapping, effort and employment standards for the profession. Learners cannot be registered unless they have been given adequate information about the job role.
3. Provide four to twelve weeks of technical, behavioural, mindset and professional-presence skills training, with psychologists mentoring trainees and tracking them in the workplace.
4. Set up interviews with employer partners for immediate job placement. Each trainee is assured of at least three job interviews.
5. Offer mentorship and a community that follows graduates into the workspace, tracking their engagement with the job, and improving retention rates.
6. Assess return on investment for employers, students and society.
7. Collect and analyse data at all stages.

In India, Generation is live across 41 cities, having trained over 11,000 students so far in 5 professions.

- **Healthcare**: General Duty Assistant (8 weeks of training)
- **Hospitality**: Food and Beverage Steward (7 weeks)
- **Retail**: Retail Sales Associate (4 weeks)
- **Beauty and Wellness**: Beauty Therapist (4 weeks)
- **BFSI**: Finance Loan Officer (4 weeks)

So far, out of the over 8,000 students trained, 100% received job offers, of which 78% accepted, and approximately 62% were retained during the first quarter in their first job. All 248 employer partners were willing to hire again, and approximately 20 have committed to sharing costs.

Students make more informed choices leading to less dropouts,when they are mobilized for TVET courses on the basis of their aspirations and with adequate knowledge of job roles and career prospects.

Above: The sewing machine operator course at Learnet Skills provides basic skills to start a career in garment manufacturing. Okhla, New Delhi, India.

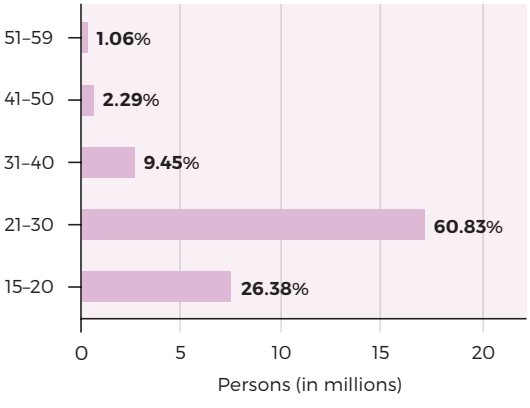
Another key reason why STT is not benefiting youth is that they are mobilized for these courses but not given adequate information and exposure to the job role and occupation they are about to be trained for. When students are mobilized for TVET courses on the basis of their aspirations and with adequate knowledge of job roles and career prospects – as with McKinsey's Generation Project (see Case Study 5) – they make more informed choices, leading to less dropouts. The Generation Project works with employers and training partners to ensure that key differentiators in terms of domain knowledge and behavioural traits are included in the curriculum. Students receive mentorship during training, are assured of multiple job interviews and support at their workplace. Employers benefit from receiving better-trained workers and a better retention rate.

The STT courses designed by the various ministries, as well as the long-term courses at ITIs and the polytechnics, are generally targeted towards enabling employment in the formal sector. However, many beneficiaries of these courses end up in the informal sector or remain unemployed, indicating that the lessons from Rustomjee Academy for Global Careers and the McKinsey Generation project – regarding preparing the learners adequately and setting expectations correctly – need to be adopted more widely.

Employability, self-employment and entrepreneurship

According to the Periodic Labour Force Survey (PLFS) carried out between July 2018 and June 2019, youth in the 15–30 year age range constitutes 87% (see Figure 5) of the 28.2 million unemployed in the working age group of 15–59 (PLFS, 2020). 90% of these youth have had no vocational training, 2.74% have been informally trained and just 7.23% have had formal training. The latter number indicates that for over 2 million youth, vocational training has not resulted in employment. Youth in the 15–30 age group also comprise over 42% of the 257 million strong NEET segment (PLFS 2020). 96.2% of this segment comprises women. Only 1.14% of this segment have had formal training and 2.21% have had informal training. The quality of TVET available to these groups is therefore a matter of special concern.

FIGURE 5
Profile of unemployed youth in the labour force in the working age group 15–59



Schools need to take charge of assessing vocational education on their own. Assessment by the sector skill councils can be sought as an additional certification by those students who intend to seek employment.

One way to improve employability is to ensure that students are trained in sectors in which there is a requirement for trained personnel in their local geographies. Given that schools, colleges, and universities will begin providing vocational education at scale, and since youth in rural areas prefer to be employed closer to their homes, skills gap analysis will need to be done in a much more granular manner, going beyond the district level down to the panchayat level. As of now, data exists only at the state level through the SkillsIP platform of the NSDC, and the SANKALP programme that assists in the preparation of skilling plans at the district level. It is also imperative to prepare students not just for jobs in the formal sector – because those are very few in number – but also for self-employment and entrepreneurship. Since the 1980s, jobs have been increasing only at 2% annually even though the economy has been growing at much higher rate (Maira, 2014). Therefore, providing training for self-employment – and for entrepreneurship where possible – is just as important for adults.

A Labour Management Information System (LMIS) is a key resource that can assist in the selection and delivery of courses that are relevant to youth in their particular geographies, by improving the flow of data and information to employers as well as jobseekers, and aiding planning. It can help youth with details of the training employers are seeking, and prospects and placement opportunities related to the training, so that they can register on the system once they are trained. Training providers can learn about courses for which there is a demand for trained candidates, and the industry can get information about the availability of trained workers in particular geographies and in different sectors of the economy. The LMIS system envisaged by the Ministry of Skill Development and Entrepreneurship (MSDE) was to consist of multiple repositories of data pertaining to certified candidates, trainers, training providers, training centres (a training provider can have more than one training centre), assessors, assessment agencies, employers, courses, and prospective candidates. However, India's LMIS portal[19] is not yet a fully functional one that can put together institutional arrangements, data, procedures and mechanisms to produce labour market information as per global best practices (MSDE 2018). In its absence, training providers decide which courses to offer only on the basis of coarse-grained skill gap projections from incomplete information that is generally drawn from incomplete voluntary disclosures of requirements by industry, and on projections made by NSDC and the sector skill councils (SSCs).

The Skills Intelligence Platform[20] created by the NSDC is designed to move towards a full-fledged LMIS, but in the interim, the selection of courses remain not always relevant. There is a significant lack of awareness and information among potential trainees regarding their availability, utility, and potential including job prospects. There is also a lack of empirical evidence that shows that those who have undergone such training are actually getting better jobs and higher incomes. This is one of the key reasons why mobilization of students willing to undertake skills development programmes remains one of the biggest challenges in the ecosystem at the moment. However, as discussed in the previous section, this problem can be resolved through adopting student mobilization methods in the McKinsey Generation project (see Case Study 5), and through the widespread use of vocational aptitude tests, career counselling and guidance as discussed in the following section.

Lessons from the experience of educational institutions

The early experience with vocationalization of school education in Haryana has several lessons for the forthcoming efforts at integrating vocational education during implementation of the NEP 2020. For delivery of vocational courses in Haryana[21] and other states in the past – and more recently through the Samagra Shiksha Abhiyan – secondary schools have used NSDC training partners to provide training, and sector skill councils for conducting assessments. The national as well as state boards in each state typically conduct the assessment of theoretical domain knowledge, while the SSCs evaluate practical training and provide placement assistance to students who require them. The involvement of the SSCs increases costs and the complexities associated with assessment, often resulting in delay in certification. Given that many students don't immediately take up a job but opt to continue into higher education, it is unnecessary for them to pay for certification from the SSCs. The assessment by the SSCs can be sought as an additional certification by only those students who intend to go out into the world of work. Of course, such a plan would succeed only if schools are in a position to arrange for both the theoretical as well as the practical aspects of training for each vocation (see Page 93). When the services of NSDC training partners is used for curriculum delivery, assessments, and placements, then evaluation by the SSCs becomes the only option. Other challenges, such as providing pathways to higher education, (See 'Secondary and Higher Secondary schools', Page 61), also need to be addressed in a more broad-based manner.

[19] https://www.lmis.gov.in/

[20] https://skillsip.nsdcindia.org/

[21] http://nsqfharyana.hsspp.in/

CASE STUDY 6

UNICEF – Comprehensive Life Skills Framework and a Career Guidance Portal

The UNICEF India Comprehensive Life Skills Framework was developed by the United Nations Children's Fund (UNICEF) India in collaboration with in-country partners including UN sister agencies, civil society organizations, academia, and independent experts[22]. The framework focuses on skills that support the overall development and empowerment of children and adolescents across 6 states in India, helping them become informed and lifelong learners, change social inequalities, and gain control over their lives.

The aim is to provide policymakers, teacher educators, and other groups with a theoretical framework for life skills in the Indian context that facilitates mainstreaming life skills in schools and communities. Ten core skills have been mapped into four important dimensions that are aligned with the four pillars of education discussed in the 1996 UNESCO report titled 'Learning: the treasure within', also known as the Delors report[23].

Given that there are limited tools for life skills measurement, either in India or globally, UNICEF, in collaboration with Young Lives, has developed a Comprehensive Life Skills Measurement Framework for in-school students of Grades 6–8, and for out-of-school adolescents who are between 11 and 18 years of age. The life skills measurement tool (LSMT) for in-school adolescents has been developed in English, Hindi and Assamese, and has been piloted among 1,890 Hindi speaking adolescents and 600 Assamese speaking adolescents. Another version of the tool based on listening comprehension is used for adolescents who are not able to read or write.

CAREER GUIDANCE PORTAL[24]

Given that young people in India, especially girls, do not get the support they need from the education system in choosing a career path that matches with their aspirations, interests and aptitudes, UNICEF has helped establish career guidance portals in partnership with the government and the private sector to enable learners to make successful transitions from school to higher education or work, and to manage their career pathways and lifelong learning. It is critical that all adolescent girls and boys have the skills and knowledge to make informed decisions concerning their future pathways. This can ameliorate the high dropout rates observed at various stages in the educational system, and also improve retention in jobs.

Source: Based on documentation from UNICEF including online material provided by Mr Terry Durnnian

CAREER GUIDANCE PORTAL FOR ADOLESCENTS

Career awareness → **Career planning** → **Decision making**

6 states
- Andhra Pradesh
- Bihar
- Gujarat
- Jharkhand
- Madhya Pradesh
- Rajasthan

47,015 schools

9,853,895 students

4,882,991 girls

4,970,904 boys

- Multilingual
- Gender responsive
- Inclusive
- Real-life role models
- Career growth trajectory
- Multiple access pathways

The career portal provides comprehensive information to students in Grades 9 to 12 on possible careers, colleges, entrance examinations, vocational institutions, and scholarships. It is dynamic, as it is updated and kept relevant with time. Information on the portal is available in specific state languages as well as English. The content is gender inclusive and attempts to break gender and ability stereotypes.

Approximately 9.8 million students (49.6% of whom are girls) from Grades 9 to 12 are registered on the portal in 6 states (Andhra Pradesh, Bihar, Gujarat, Jharkhand, Madhya Pradesh and Rajasthan). Around 1.2 million students (50% of whom are girls) are actively engaged on it with support from 59,000 trained teachers.

School teachers are the main resource for career guidance to students but generally lack up-to-date knowledge of opportunities, schemes and scholarships. The portal provides teachers with knowledge of its structure and content, both virtually and face-to-face, so that they can assist students in accessing and exploring the portal for career guidance.

22 United Nations Children's Fund (UNICEF). (2019). Comprehensive Life Skills Framework: Rights based and life cycle approach to building skills for empowerment.

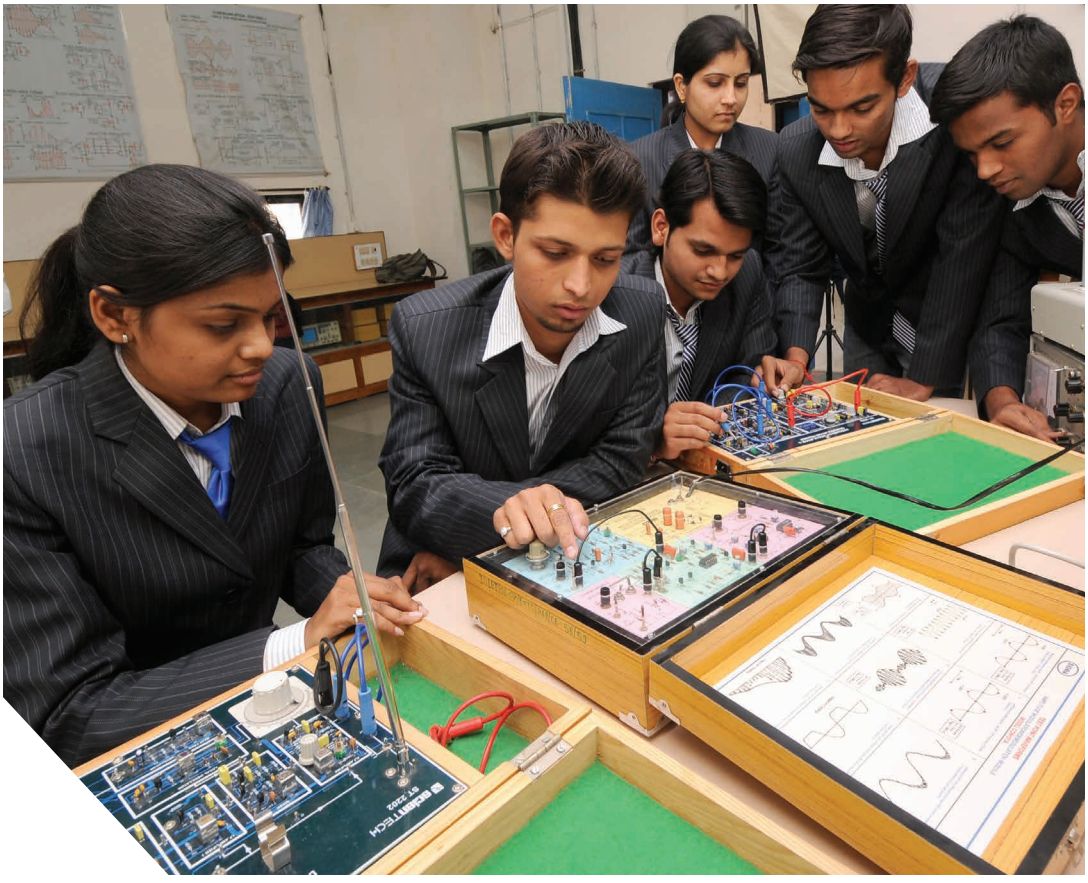
23 https://unescocat.org/en/2018/10/10/learning-the-treasure-within-1996/

24 https://www.unicef.org/documents/india-every-child-learns-education-strategy-2019-2030

Students require assistance in selecting the vocation they would like to take up in secondary school. This requires making Vocational Aptitude Testing (VAT), career counselling and guidance (CCG) available to all students before they enrol in particular TVET courses (see Page 98). UNICEF India (see Case Study 6), in partnership with private sector and government, has created a Career Guidance Portal and piloted it in 6 states among nearly 10 million students. The career portal provides comprehensive information to students in Grades 9 to 12 on possible careers, colleges, entrance examinations, vocational institutions, and scholarships. Information on the portal is available in specific state languages as well as English. The portal also provides school teachers with knowledge of its structure and content so that they can assist students in accessing and exploring the portal for career guidance. The portal is organized so that a learner can look up a career domain and find out eligibility, educational requirements, colleges in different countries and states in India that offer relevant courses, scholarships and fellowships, entry-points and growth options in the career domain of their choice. UNICEF is using the learning from states where the portal has been rolled out to improve user experience in states where the portal will be launched in the future. In collaboration with its technical partner iDreamCareer[25], UNICEF is aspiring to reach the career guidance portal to all states in India.

The Haryana pilot programme offering vocational education that began in 2012 was aimed at stemming dropouts in higher secondary school. Their experience has in fact shown a reduction in the latter. An impact study done by NCERT[26] in 2017 found that employability of students was as high as 90% (Source: PSSCIVE). The feedback from students was also encouraging. Over 66% of them found the vocational courses beneficial and felt that this exposure had helped them appreciate the rest of their academic content better and that their confidence levels as well as overall academic performance also improved. Parents confirmed that they found an overall improvement in the children's interest in academics as well as in their performance. 72% of alumni surveyed said it enhanced their ability, and employers confirmed that these students performed better relative to those that did not have access to the training.

In higher education, a review of University Grants Commission's (UGC) early efforts to provide vocational education in 1994/95, sponsored by the Planning Commission and conducted by the Institute of Applied Manpower Research[27] in the year 2000 (IAMR, 2000), found that institutions were failing to achieve employability, the main objective of the programme. Institutions were failing to provide infrastructure and



Right: Students in a practical training session. Learning by doing can improve employability, especially in higher education institutions. Nagpur, Maharashtra. India.

Opposite page: Students familiarize themselves with testing equipment. Early exposure to various vocations can help students align their natural abilities with career prospects. India.

25 https://idreamcareer.com/

26 The report of this study is not available in the public domain

27 Now renamed to National Institute of Labour Economics Research and Development (NILRED).

Colleges need to innovate towards introducing vocational education along with apprenticeships, adequately trained teachers, and opportunities for campus recruitment.

adequately trained teachers, career guidance and counselling, and opportunities for campus recruitment. Student feedback also pointed to the need for more practical lessons, better library and laboratory facilities and opportunities for apprenticeships as desirable improvements. These continue to be shortcomings even today. With regard to improving course content to serve local needs, students expressed the desire for training in modernization of local industries, more field experience, and knowledge of local resources and their commercial use. These suggestions can be treated as inputs going forward, towards planning for having more local connect in curriculum and more apprenticeships.

The more recent experience with BVoc programmes introduced as of 2014 has also been mixed, as discussed in the section titled 'Colleges and the new skill universities' on Page 64. No formal evaluation has been conducted by the UGC so far, but personal interviews with management of colleges that received funds to launch courses in the programme's early years reveal that they are struggling to sustain themselves, and some have even closed down (Wadia, 2019b). This is partly due to poor course design, the financial instability caused by poor and irregular grant disbursal from the UGC, and poor uptake of the BVoc programmes among students in the initial years. Many colleges chose to run the BVoc programme in one or two sectors in exactly the same way as they run all their other courses, i.e. by purchasing equipment with the initial grants from the UGC and hiring faculty to teach the courses in-house as a self-financed course. However, they found it difficult to sustain the course on the basis of fees alone and did not have any means to offer new courses or renew existing ones. This experience brings focus on the need for a change in mindsets within academia and to develop the ability to innovate towards introducing vocational education. The TISS-SVE model for BVoc programmes is a successful example from which useful lessons may be drawn. Of note are their revenue-sharing financial partnership with industry partners, use of an ERP system to successfully enforce contracts, and their reliance on on-job-training and keeping fees affordable for students (Wadia 2019, also see Case Study 2 on Page 65).

Above: Trainer demonstrates the use to tools to budding electricians. Okhla, New Delhi, India.

Trainers and assessors

Pre-service and induction training, conditions of work, and the continuous professional development of trainers and assessors, are easily some of the most challenging aspects of TVET provision in the country today. The challenges faced by trainers and assessors are the same, since most trainers also function as assessors in appropriate contexts. All TVET courses on offer at present – the STT through the NSDC ecosystem, long-term training through ITIs and polytechnics, and vocationalization of school and higher education – share a common serious problem, namely the paucity of adequately capable and trained teachers/trainers and assessors. A recent research study by the British Council titled 'Trainer Effectiveness in the Indian Skills Ecosystem' confirms the widely held perception that a career as a trainer is unattractive due to the lack of career progression and the relatively low emoluments that come with the job and does not help attract the best talent into the profession (British Council, 2020).

The pre-service and induction training, conditions of work, and the continuous professional development of trainers and assessors, are easily some of the most challenging aspects of TVET provision in the country today.

Trainers face other challenges related to wages too. As with most contract workers, they have to cope with irregular salary payments and do not have social security and other benefits. It appears that they are marginalized even within the training ecosystem. Most of them are hired on contract for short periods since the training providers (TPs) who employ them also do not have long term visibility into the need for a particular course. Trainers have pointed out that their induction training is not very effective, and they do not get interesting opportunities to upgrade their own skills in industry environments, unless they are employed by very large TPs who run multiple training centres. Most TPs, especially the smaller ones, do not have provisions for the continuous professional development of their trainers. A large number of trainers have to make do with upgrading skills on their own. Trainers also have limited prospects for career growth. They can at best aim to become master trainers. All these factors make the job unattractive and lead to a considerable degree of attrition. The role for assessors is just as critical in TVET provision and they face similar problems as the trainers. This is a cause for concern, given that as with any educational endeavour, it is only when teachers/trainers are well-trained and motivated do students benefit.

Increasing the acceptability of TVET

The poor perception of TVET in India is also echoed in many countries around the world (UNESCO, 2018). By requiring that vocational education be integrated into regular school and college education, the NEP 2020 has created an opportunity to ensure that TVET is not seen as separate from – and therefore inferior to – mainstream education. If successful, it will lead to better outcomes for students, and a change of mindset towards TVET among all stakeholders. The positive outcomes of the vocationalization of school education (See 'Learning from the experiences of educational institutions', Pages 76 and 78) can also help improve its image. The experience so far, in states such as Haryana, Himachal Pradesh, Kerala, and Maharashtra, where TVET is growing, confirms this.

Since TVET is inextricably linked to jobs and wages in the minds of both students and parents, it will only stop being considered an inferior option when enough young people are able to find decent work and livelihoods as a result of their training. Personal success stories of those who have been able to do so need to be disseminated widely to inspire other young people to follow in their footsteps. One of the challenges highlighted by the MSDE in their annual report (MSDE, 2019), is the lack of premium for skilling. This is in contrast with findings by other authors (Kumar et al., 2019) who say there is a 4.7% increase in wages in the overall economy due to skilling with agriculture seeing a premium of as much as 36.9%, and industry as much as 17.9%. Clearly the difference in perception is related as much to the scope and quality of skilling, as to the fact that India appears to be in a transition stage when wages earned through TVET are growing but have not yet benefited sufficient numbers of people for it to be recognized and widely acknowledged. It is only when large numbers of high-quality courses become available in new and future-proof disciplines such as those included in Industry 4.0, and associated with robust high-paying jobs, that TVET will become truly aspirational.

Below: A camera person at work. Training in creative professions is gaining ground and is today considered aspirational with lucrative job opportunities. Kodaikanal, Tamil Nadu, India.

TVET is inextricably linked to jobs and wages in the minds of both students and parents. It will only stop being considered an inferior option when students are able to find well-paid jobs.

CASE STUDY 7

NASSCOM FutureSkills and FutureSkills Prime

NASSCOM FutureSkills is one of the large multi-stakeholder initiatives to prepare a nation with the requisite skills to future-proof its citizens' careers against the expected displacement of millions of jobs and the skills instability due to technological change. Led by the Indian IT-BPM (Information Technology and Business Process Management) industry, it was a concerted, collective action to drive workforce reskilling at scale that inspired the government, academia and individuals to join this movement aimed at making India a global hub for digital talent.

In 2016, a NASSCOM study pointed to the need to reskill about half of the 4 million people employed in the IT sector within the coming three or four years. The IT-BPM industry decided to convert this digital disruption into an opportunity through a proactive effort to manage workforce reskilling and upskilling. The aim was to mitigate the biggest roadblock to leveraging the opportunity, namely a talent shortage.

NASSCOM conducted a comprehensive study with the Boston Consulting Group to draw up the landscape of the impact of these technologies on workforce skilling. The study identified the technologies that would experience rapid growth, the associated job roles, and the corresponding skills needed to do these jobs. 155+ skills were identified, spanning over seventy job roles in ten emerging technologies, namely artificial intelligence, blockchain, big data analytics, cloud computing, cyber security, Internet of things, mobile tech, robotic process automation, virtual reality and 3D printing.

It was clear that with advancing technologies, skill profiles will undergo rapid changes, and updating workforce skills will require a concerted strategy that could place the country on the path to being the global talent hub for new and emerging technologies.

A 'Skills of the Future' group was established under the aegis of NASSCOM that recommended setting up an industry-driven, collaborative, learning platform – an aggregator marketplace. On this platform, best-in-class learning providers would provide a marketplace of relevant and timely content curated from open sources by industry experts. Learners could then go through a journey of discovery, deep-skilling and continuous learning.

FUTURESKILLS: A COLLECTIVE MULTI-STAKEHOLDER EFFORT TO DRIVE NATION-WIDE SKILLING

In 2018, the NASSCOM FutureSkills platform was unveiled by the Hon'ble Prime Minister Narendra Modi, with a focus on creating skills for new, technology-enabled jobs in India. Two years into its journey, many aspects of the collaborative vision of FutureSkills have been realized. From its beginnings as a platform, FutureSkills has emerged as an ecosystem where industry, academia and training providers collaborate. Its expert-contributed content is used by college students and employees in organizations alike, with organizations recommending foundation–level technology courses to their employees and to the academic institutes they hire from.

futureskills
A NASSCOM initiative

BLURRING LINES BETWEEN TECH AND NON-TECH SKILLS

Non-tech skills

Negotiation, winning by influence	Creative problem solving and critical thinking	Storytelling and business communication	Project/product life cycle management	Creativity and innovation
Empathy, customer centricity	Communication and comprehension	Design thinking	Collaboration	Leadership

Tech skills

Big data analytics	Artificial intelligence	Cyber security	Robotic process automation	3D printing
Internet of things	Mobile tech	Cloud computing	Virtual reality	Blockchain

FUTURESKILLS IMPACT

340,000+ registered users	**470,000+** contracted users	**100,000+** monthly active users	**~9,700** users completed SSC NASSCOM foundation courses on portal	**~1,700** users took SSC NASSCOM assessments on portal	**97,000+** users enrolled for AI & BDA foundation on FS Learning

ALIGNMENT TO NATIONAL OBJECTIVES

FutureSkills has been created by IT-ITeS Sector Skill Council NASSCOM, the skill-standard-setting body of the IT-ITeS Industry and the education and skill development initiative of NASSCOM. The council works with industry members and academic and skill development institutions for creating the National Occupational Standards. Training providers on FutureSkills are encouraged to map their courses to these standards, paving the way to creating a common language of understanding for skill development across industry and academia.

Many of the tenets of the new NEP 2020 are fully supported on FutureSkills, including emphasis on faculty development, use of NSQF-aligned online courses for credits, use of blended learning as a preferred modus operandi and most importantly, emphasis on skills like creativity, problem solving, design thinking, communication, collaboration and so on.

PARTNERING WITH THE GOVERNMENT

A report by the Ministry of Electronics and Information Technology pointed out a US$1 trillion digital opportunity for India but research was already pointing to an emerging talent gap and the need for a national reskilling effort. Seeing the work being done by industry to bridge this gap, the Government of India invited NASSCOM to extend this platform to all Indian citizens. An MoU was signed in March 2018 and FutureSkills* went live on Nov 18 2020 as India's digital skilling platform.

LAUNCH OF FUTURESKILLS PRIME

The success of FutureSkills has demonstrated the power of a common vision shared by all stakeholders. The collaboration across industry, academia, government and learning providers has driven each partner to ask as much about what they can contribute to the initiative as about what they can get from it. FutureSkills Prime draws on these lessons.

The government has provided funding of Rs 4.36 billion (US$58 million) to build the learning platform for this programme, to which industry and experts have contributed content aligned to the National Occupational Standards (NOS). The platform will be free to access with content to build digital fluency (awareness of the new technologies) as well as job-related training programmes at affordable prices. A learner can seamlessly access free and paid NOS-aligned content, assessments and virtual labs, and get certified on the skills of their choice. In its final phase, expected in March 2021, government incentives will be available to those learners who earn approved accreditations on the platform, rewarding those who make the effort to upskill themselves for the digital future.

CONCLUSION

FutureSkills is a bold approach that leverages the power of the collective and has demonstrated how competitors can collaborate with the right motivation. The vision 'To make India the global hub of talent for the emerging technologies' was inspiring, and its extension to a platform accessible to all Indians showcased and created a higher purpose. The fact that the programme dovetails neatly into a stated policy demonstrates its relevance. The FutureSkills Prime platform will aim for the following:

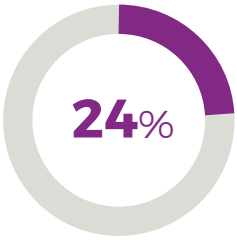
- Offer skill-based learning from an early foundation level of academics and empower students to be future-ready for the job market.
- Provide online learning content and assessments that rest on NOS. These can be used as credits in university degrees and formal academic programmes of learning on a continuing basis.
- Enable faculty development.
- Promote an effective blended-learning environment.
- Create a pan-India platform on which learners can access content designed by industry and approved by government, leading to a true democratization of technology training.

Technology is all around us, whether we work or study in the field of technology or not. FutureSkills Prime is the window that can open the eyes of our youth to the infinite possibilities of a digital future and propel India on a oath to becoming a global hub of talent in emerging technologies.

*https://www.futureskillsprime.in The learning platform is only available in India at present.

Source: Dr Sandhya Chintala, Ms Kirti Seth, Ms Sridevi Sira, Ms Swati Saini, IT-ITeS Sector skill council, NASSCOM

The traditional conception of blue-collar jobs as working with hands in various crafts and trades, and white-collar jobs as office work in aspirational professions is now changing. This is thanks to the information age and the technological disruption that is causing millions of jobs to be lost to automation even as many others are created in emerging technologies. Students need to be made aware of this shift and apprised of new opportunities. NASSCOM FutureSkills is just such an initiative that attempts to leverage the opportunity before India to become a global talent hub, by bringing together industry, academia and training providers in a unique collaboration to train youth and adults (see Case Study 7). NASSCOM identified 155+ skills spanning over seventy job roles in ten emerging technologies, namely artificial intelligence, blockchain, big data analytics, cloud computing, cyber security, Internet of things, mobile tech, robotic process automation, virtual reality and 3D printing, as key to future competitiveness. It created an industry-driven, collaborative learning platform that serves as a marketplace for courses related to these topics. Experts create content that can also be curated from open source and learners get access to high quality learning material. The just-launched FutureSkills Prime initiative is supported by the Government of India and opens up these cutting-edge resources and content – both free and paid– to all Indian citizens.



of Indian households have Internet access

of households own computers

Access to technology and the digital divide

Unfortunately, not all Indian citizens are in a position to make use of these very valuable digital TVET courses. The first and foremost challenge is the severe digital divide in the country that has been brought to the fore by the pandemic. It is instructive to look at some of the dimensions of this divide. Data from the National Sample Survey (NSS) 75th Round on Education indicates that only 24% of Indian households have Internet access (42% urban and 15% rural), and only 11% of households own computers (4.4% rural and 23.4% urban, not counting smartphones) (NSS75, 2019). According to a recent IAMAI-Nielsen survey, India had 504 million Internet users as of November 2019, of which 433 million were over the age of 12, and 65% were male (IAMAI-Nielsen 2020).

Another survey conducted among students by ranking agency Quacquarelli Symmonds (QS) during the early months of the pandemic showed that out of over 7,500 students surveyed, 72.6% – more than 97% of whom were between 16 to 27 years of age – were using mobile phone hotspots to access the Internet, a solution considered 'low-tech' by UNESCO (QS, 2020). Only 15.87% of students surveyed had broadband access, but even those reported issues of poor connectivity, power availability, and signal quality. Among those using mobile hotspots, nearly 97% faced poor connectivity or signal issues. To put these figures into perspective, only approximately 30% of the Indian population has access to smartphones. The use of TV channels for education, the technology with the deepest penetration, is also not a panacea given that only 67% households have access.

The first and foremost challenge to the spread of digital TVET in India is the severe digital divide in the country that has been brought to the fore by the pandemic.

Above: Trainees at a computer lab run by Learnet Skills. Acquisition of digital skills by learners and provision of online courses by TVET providers is critical to ensure continuity of learning. Okhla, New Delhi, India.

Opposite page: Students attend a computer training session under AIF's Market Aligned Skills Training (MAST) programme. West Bengal, India.

The lockdown due to the pandemic has focused attention on the severity of the digital divide in the country and governments will have to work urgently to mitigate and eventually remove this divide. One important way is by helping to provide Internet access to all educational institutions. The BharatNet[28] project is designed to provide broadband connectivity to all 250,000 gram panchayats. Its mandate needs to be extended to include provision of wi-fi access to all educational institutions and health facilities within each gram panchayat. The state governments can also consider making a one-time provision of laptops with Internet access to all teachers and trainers as recommended by the NEP. This is because while smartphones or tablets can be used to consume content, laptops are required for content creation. They must also make arrangements to train teachers and trainers in the creation and use of digital content and in online education. State governments could also consider making a similar one-time provision of tablets or smartphones at subsidized rates to students who cannot otherwise afford devices.

TVET provision and the COVID-19 pandemic

At the peak of closure due to the pandemic in April 2020, UNESCO estimated that 91% of the global student population were impacted in 194 countries. Nearly 1.6 billion students were out of school during April 2020, and the number at the end of September is still 850 million[29]. There are 134 countries that are still experiencing countrywide closure of educational institutions, including India which has a school-going population of approximately 248 million students (UDISE, 2018/19) and a college-going population of over 37 million (AISHE, 2019). TVET institutions have also been closed and most apprenticeships interrupted.

The number of candidates being skilled by NSDC and its partners has dropped during the pandemic to half, from approximately 400,000 each month. However, NSDC has been facilitating online acquisition of skills through the eSkillIndia[30] portal which allows interested skill-seekers to enrol in e-learning courses from an aggregated catalogue. The portal offers more than 400 courses, and 60% of these are available free of cost, curated from best-in-class knowledge providers such as the Bombay Stock Exchange, Apollo MediSkills, Tata Consultancy Services, IBM and SAS. To add to its course catalogue, eSkillIndia recently partnered with UpGrad, British Council and Saylor Academy, aiming to provide high quality online courses in areas such as data analytics, customer relationship management, and entrepreneurship. Through a partnership with British Council's EnglishScore application, English language skills have been made available for 100,000 students, along with free assessment and certification. Already 24,000 students have taken the EnglishScore assessments and redeemed their certificates. With Britannia Industries, NSDC will provide digital and entrepreneurial skills training to 10,000 homemakers. So far, entries have been received from more than 1.5 million homemakers. As of 31 July 2020, enrolments on eSkillIndia portal had exceeded 250,000, registering a growth of over 1,700% since February 2020. This move towards online education is characteristic of the response in all streams of education, an initial emergency response followed by a more sustained longer-term response.

[28] http://www.bbnl.nic.in/

[29] https://en.unesco.org/covid19/educationresponse

[30] https://eskillindia.org/

TVET has a very large role to play in relieving the strain of the pandemic since it can help youth respond to the various situations caused by it, and also help them find alternative livelihoods through skilling, upskilling and reskilling. In a reflection piece on how TVET institutions can contribute to overcoming the impact of the COVID-19 pandemic on youth, working adults, and the community, three types of responses have been identified (Mazumdar & Araiztegui 2020).

❶ **Immediate response**: Use of technology for continuance of learning, use of schools as production units, and supporting public information and awareness in the community. One early example of using TVET institutions in India as production units is that of ITI Kharpuria[31] in Cuttack, Orissa, and its attempts to develop a mobile swab sample collection kiosk, two robots, a sanitization tunnel, magnetic stands, contact tracing apps and an automatic sanitizer dispenser as part of its efforts to fight COVID-19.

❷ **Mid-term response**: When the focus is on measures that can be taken by TVET institutions to prepare themselves for a similar situation in the future, and to gradually prepare for any post-pandemic disturbances or opportunities that arise. The effort by Generation India Foundation[32] to offer a free online course for nurses is an example of driving the upskilling of key healthcare professionals with concrete, accessible resources.

❸ **Long-term response**: Addressing the fundamental concerns raised due to COVID-19 regarding the way people live, work, consume and enable development, by bringing in social justice, environment and local development as core principles of TVET, and pointing to the adoption of the SDGs as the overarching principle of future TVET development.

Several state governments such as Uttar Pradesh, Bihar, and others have had to assist a large number of returning migrants. They have resorted to skills mapping and using vocational training as needed to help the migrants find decent work. There is also a large unmet need for TVET in the healthcare sector, not only for doctors and nurses, but also for trained personnel in many areas of allied healthcare, various types of technicians, ancillary hospital staff, mental health professionals etc. – people who will be needed to run all the facilities that need to be set up. The challenge of being able to deliver on these TVET goals is very real, given that the pandemic has only underlined the weaknesses in the digital infrastructure and the capacity for the provision of TVET that exists currently. Going forward, India must aim to increase the reach of digital infrastructure throughout the country, and also focus on preparing high-quality online education material for students, that can be used by them even beyond the pandemic.

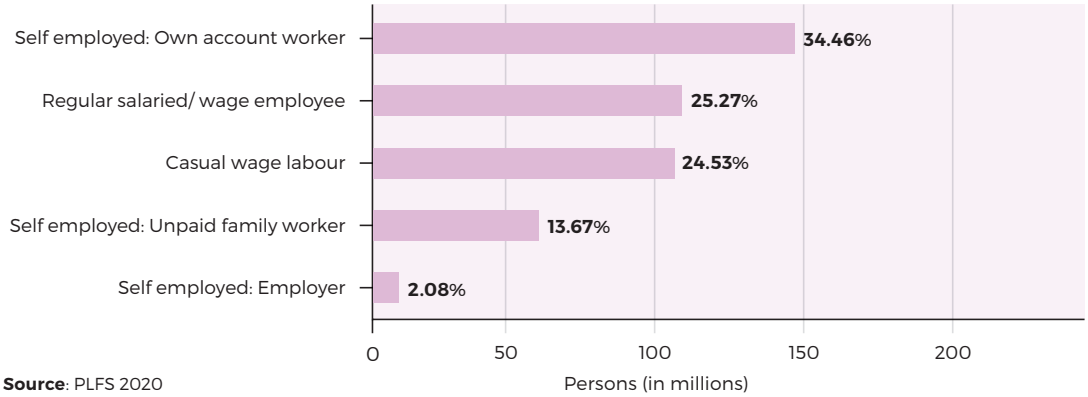
[31] https://skillodisha.gov.in/osda/journey-so-far

[32] https://www.generation.org/india-covid-19/

TVET for informal workers

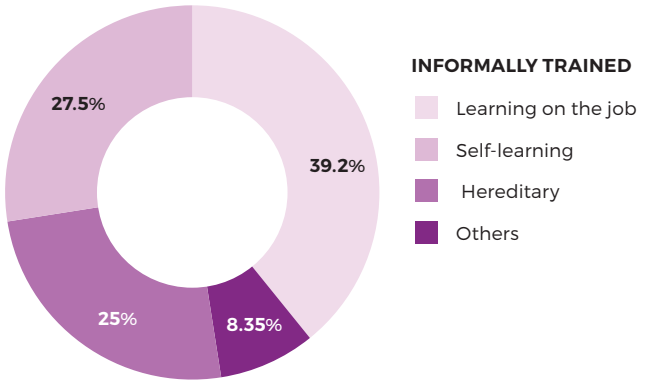
Informal workers are characterized by their lack of social security and benefits, which makes them particularly vulnerable to the devastating effects of the pandemic. Of India's employed workforce of approximately 424 million people in the age group of 15–59, only 25.27% are regular salaried or wage employees (see Figure 6), and the remaining are either self-employed or casual workers (PLFS 2020). Since some of the wage employees also do not receive benefits nor have social security, informal workers account for just over a staggering 90% of the workforce (MoF, 2020). Of the rest, approximately 34.46% are self-employed own account workers, 13.67% are unpaid family workers, 24.53% are casual wage workers and only 2.08% are employers.

FIGURE 6
The employed labour force (aged 15 to 59) **classified according to employment type**



Source: PLFS 2020

FIGURE 7
Breakup of the sources of informal training of the employed labour force



The Female Labour Force Participation (FLFP) is only 26.47%, accounting for approximately 111 million workers.

In terms of education, 53.87% of the employed workforce in the 15–59 age group – just over 228 million people – are educated only up to Grade 10 or below. 22.34% – about 95 million – are either non-literate or literate without formal schooling. Only 3% have received formal vocational training, 15.9% have received informal training (see breakup in Figure 7) and 81% have had no vocational training. Given this profile, using the Recognition of Prior Learning (RPL) mechanism for certification of informal learning, and introducing innovative models for work-based learning, are likely to be the two most useful approaches for providing TVET to this group.

In 2014, the National Skill Development Agency (NSDA) did a pilot study on mobilization for training in some agrarian districts of UP and a relatively industrialized area of coastal Tamil Nadu and came up with the following interesting insights (Rai, 2018).

- Students and parents preferred either part-time or on-job training (OJT) to full-time courses, since the former allowed them to earn while learning.
- Students preferred white collared jobs the most, followed by blue collared jobs in manufacturing. Blue collar service jobs as a waiter, security guard, or a salesperson were the least attractive.
- A preference for local training was evident across both genders and geographies.
- Micro-duration courses and inclusion of English speaking and personality development modules were also attractive.
- A lack of awareness was partly responsible for poor mobilization.

In the rural sample, women cited lack of basic infrastructure, training facilities not being in a nearby accessible location, apprehension of social disapproval and gender role stereotypes as challenges. Endorsement by word of mouth and testimonials from successful students were critical to get students to commit. People wanted skills that would allow them to earn a livelihood in their local towns so that they can remain linked to their social support network. They were aware of the high costs of living in the cities. Parents were willing to pay fees and even a premium/ bribe if there was meaningful placement available at the end of the training. Students had been through more than one course already and were not employed.

[33] https://aif.org/our-work/livelihoods/

Training cum production centres by American India Foundation

Recognizing the need for rural women to be trained and employed close to their homes, the American India Foundation[33] set up a training cum production centre (TPC) in Rewari, Haryana, in 2015. To ensure employment opportunities for the women after completion of training, a small production centre for garment manufacturing was established within the training centre premises. The model also aimed at providing OJT and facilitating the development of entrepreneurship skills among those women who were interested in starting their own venture. Even though families did have reservations about sending their daughters or daughters-in-law out of home for work, they did not stop them from going to the TPC. Women who could not come to centre but were willing to work at home were also engaged with the centre. Later, a self-help group (SHG) was formed to manage the production centre.

SHG members received training in handling financial transactions; dealing with banks; procuring raw materials; product marketing; order processing; delivery and quality control, i.e. all the responsibilities involved in running the production centre smoothly. Many local women gained enough confidence from the training to turn entrepreneurs, setting up their own small boutiques or shops with support from the centre. The success in Rewari has so far spawned, with the generous support of donors, eight more centres around the country, including a unique collaboration with a government ITI in Lucknow, Uttar Pradesh, supported by Dave Sharma, to provide employment to women completing training at the ITI. In all, over 1,450 women were trained from April 2015 to March 2020 across the centres. More such well-thought-out initiatives could help create decent work and livelihoods for many more deserving rural women.

Source: American India Foundation

Recognition of Prior Learning

Despite the promising results from NSDC's recent impact evaluation of RPL (NSDC, 2019b), there is not enough evidence to suggest that RPL certification can help all classes of informal workers improve their incomes. As mentioned earlier, over 50% of the employed labour force in the 15–59 age group are self-employed and they are not yet making use of the RPL mechanism. Casual workers, regular wage workers who are part of the informal sector, and the unemployed who have informal training constitute the target group of the RPL mechanism that uses government funding to certify people in order to improve their incomes. Those seeking employment continue to believe that employers see little value in the certification and will not pay higher wages for it, making it difficult to get them to enrol for certification. See Pages 51–54.

RPL will not succeed until most employers, in both formal and informal sectors, give credence to its certification. Workers with RPL certification must ideally be able to command higher wages but this will require that any gaps in their training be filled adequately. This calls for a much more careful and detailed analysis of their existing knowledge, not only in their core domain skill but also in other competencies. The orientation and training they receive at present is not sufficiently long in duration to be able to identify and fill gaps comprehensively. Despite the challenges of higher costs, up to three to four months of training ought to be imparted to persons already in the workforce who have acquired skills informally and have relatively low levels of education.

$ 552 billion can be added to India's GDP by the year 2025 in a best-in-region scenario by increasing Female Labour Force Participation from 27% in 2014 to 37% by 2025.

(Woetzel et al., 2018.)

Opposite page: Job aspirants training to be electricians under AIF's Market Aligned Skills (MAST) programme. Ahmedabad, Gujarat, India.

Issues of inclusivity

The data on vocational training from NSS 75th Round – showing that on average, 5% of people from urban and rural areas in the age group 12–59 have received some form of vocational education – hides a considerable degree of variation within these groups (NSS75, 2019). For instance, the statistics relating to women in rural areas are quite stark. Only 0.2% of rural women are currently receiving formal vocational training, 0.5% have already received some formal vocational training, and 1.4% have received non-formal vocational training, leaving as much as 97.9% of women with no training at all. This number improves very slightly in urban areas to 96.3%, with 2.5% either receiving or having received formal training, and 1.2% having received other than formal training. Given that 41.2% women are not literate and another 20.4% only have primary education, the provision of vocational training to these women assumes paramount importance.

The participation of women in the labour force is also very low. As mentioned in the previous section, Female Labour Force Participation among women aged 15–59 years in India is just under 26.5%, which is one of the lowest in the world (PLFS 2020). The regional variation across the country is also very high and falls to extremely low levels in some states. For example, Bihar has an FLFP rate of 4.49% that is lower than that of Yemen (5.98%) – the country with the lowest FLFP rate in the world. A McKinsey study estimates that India could add $552 billion to its annual GDP by the year 2025 in a best-in-region scenario by increasing FLFP from 27% in 2014 to 37% by 2025 (Woetzel et al., 2018).

Women also face significant income inequality in India. An analysis of 2018 household survey data from Centre for Monitoring Indian Economy (CMIE) shows that among working individuals (after removing outliers), median monthly income of women (Rs 22,500) is 43% lower than that of men (Rs 39,500). The difference is 12.6% for individuals working in the IT sector. Even in short-term training schemes such as the PMKVY II, a gender analysis shows that although female trainees in the programme had a higher placement rate (47.1% against 44.1% for men) over all age groups and educational attainment categories, the average monthly income of women was lower than that of men in 15 of the top 20 job roles, accounting for 65% of the placements (NSDC, 2020).

The PFLS also shows that as much as 30.48% of the working age population, or over 257 million people, are in the NEET segment. This group consists overwhelmingly of women (96.2%) but also includes PwDs, Scheduled Castes (SC), Scheduled Tribes (ST), religious minorities and persons with other sources of disadvantage such as economic, geographical and so on. TVET that is targeted to their special needs can help improve their chances of finding decent work. The focus on inclusivity must be horizontal, across all programmes.

Summary

The outcomes of thoughtfully designed short-term training courses – that keep the aspirations of youth and their long-term growth and development in mind, and give them adequate information regarding the job role and occupation they are being trained for – are far superior relative to the courses that are presently being offered by the training partners of NSDC. In order to improve the employability of youth in rural areas, skills gap analysis needs to be conducted at a much more granular manner, down to the Panchayat level. It is also necessary to prepare students not just for jobs in the formal sector but also for self-employment and entrepreneurship.

Vocationalization of school education using NSDC training partners for curriculum delivery and the sector skill councils for assessment increases costs, and is unlikely to scale as envisaged by the NEP. Many colleges that run the BVoc programme in exactly the same model as all their other courses are finding it difficult to sustain themselves and some are even closing down. The experience so far brings focus on the need for a change in mindsets within academia and the need to innovate towards introducing new models of providing vocational education.

A career as a trainer/ assessor is unattractive today and the best talent is not attracted to this profession. Many trainers are employed on contract and have to cope with relatively low wages, irregular salary payments, a lack of social security and other benefits, and poor career prospects. Trainers have also pointed out that their induction training is not very effective, and they do not get interesting opportunities to upgrade their own skills in industry environments.

The poor perception that is associated with TVET in India is also echoed in many countries around the world. By requiring that vocational education be integrated into regular school and college education, the NEP 2020 has created an opportunity to ensure that TVET is not seen as separate from – and therefore inferior to – mainstream education.

The severe digital divide in the country that has been brought to the fore by the pandemic is a serious challenge to the spread of digital TVET in India. Going forward, India must aim to set up digital infrastructure throughout the country and prepare high-quality online education material for students that can be used by them even beyond the pandemic.

Informal workers account for just over 90% of the Indian workforce. The RPL mechanism for certification of informal learning and introduction of innovative models for work-based learning can be good ways to provide TVET to this group. The participation of women in the labour force is very low, just under 26.5% and women also face significant income inequality.

ASPIRATIONAL FUTURES

University students of electronics at a practical training session. Nagpur, Maharashtra, India.

CHAPTER 6

The way forward

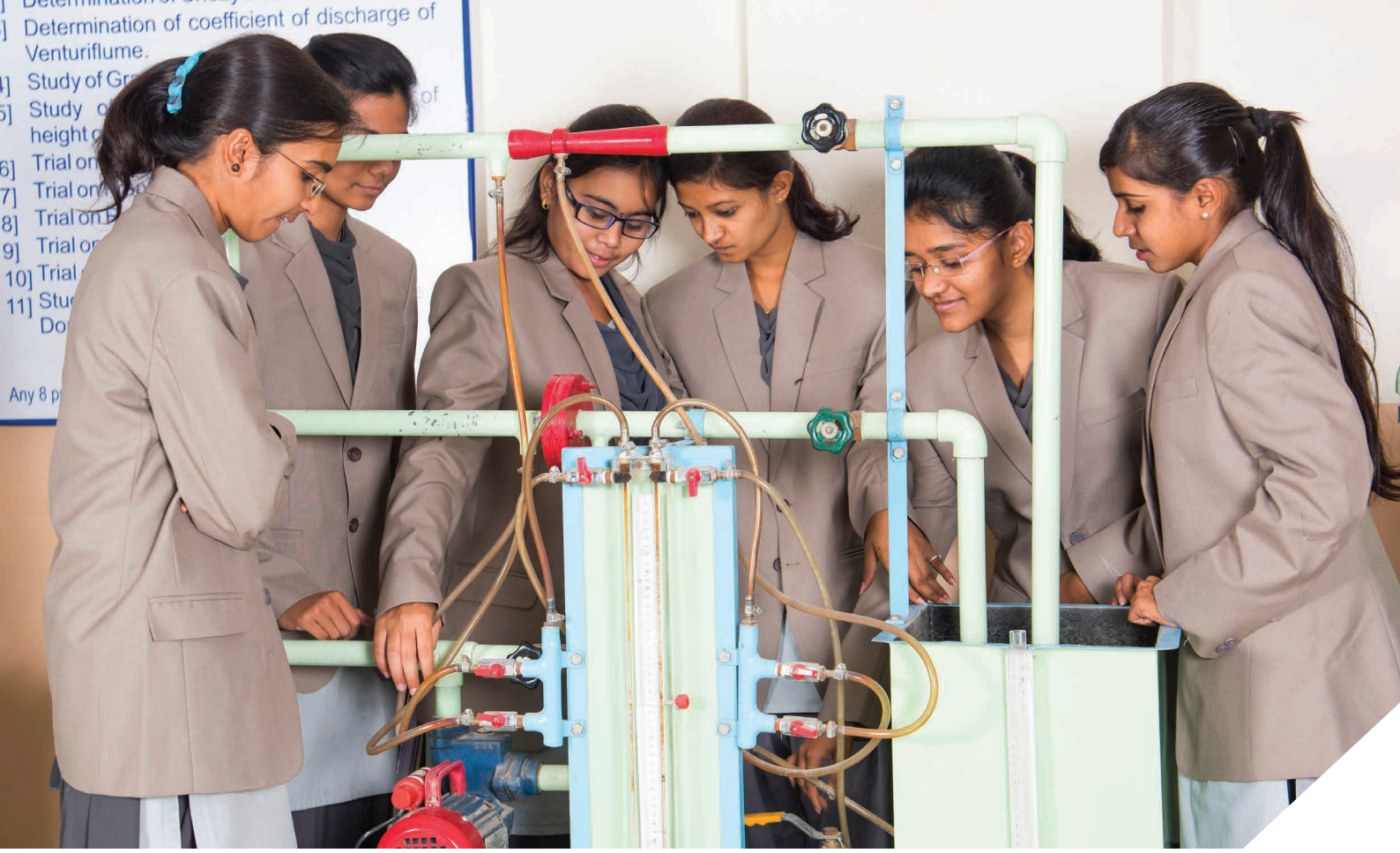
This section contains suggestions for scaling out quality TVET education through mainstream educational institutions, and for reforms in TVET provision by other providers. The solutions outlined here address the means to achieve the targets associated with SDG 4 or 'Quality Education', and other targets that are part of the 2030 Agenda for Sustainable Development.

6 The way forward

The vision for providing quality TVET at scale through educational institutions

Vocational education integrated into mainstream school and college curricula can provide students with a more holistic education spread over a period of several years. Hence the NEP 2020 regards such integration as the most optimal way to prepare students for life and livelihoods. Educational institutions can ensure that the acquisition of skills and competencies in a particular domain of work is combined with building character and personality traits such as critical thinking, problem solving, the ability to work in teams and communication skills along with a more broad-based liberal education that helps prepare students to take on the long-term challenges of the world of work. Such an approach will also bring back the culture of experiential learning within educational institutions and instil respect for diverse talents and vocations among students. It is also one of the most important ways of overcoming the social status hierarchy associated with TVET in the country today. Bringing in educational institutions into the fold of TVET providers will also create the opportunity to educate students in a Social Emotional Learning (SEL) environment that will help them build the resilience needed to take on the myriad challenges of a post-COVID world.

Bringing in educational institutions into the fold of TVET providers will create the opportunity to educate students in a Social Emotional Learning (SEL) environment that will help them build the resilience needed to take on the myriad challenges of a post-COVID world.



Above: School students undergo practical demonstration-based training, Such learning, outside the confines of a classroom, needs to be encouraged. Mumbai, Maharashtra, India.

Opposite page: School students learn ICT basics. Integration of skills in general education is critical for providing a strong foundation for vocational careers. Yavatmal, Maharashtra, India.

Provisions of NEP 2020 for integrating TVET into schools

The NEP 2020 makes several provisions that will help achieve the goals of integration of vocational education, of helping students who take up vocational careers do so with confidence and pride, through an appreciation of their own talents, interests and aspirations. Towards this, the policy commits to universalization of education between the ages of 3 and 18, ensuring that every child receives free education in government schools until Grade 12. It provides for every student – beginning with middle school (Grades 6–8) – exposure to multiple vocations in different sectors of the economy such as arts and crafts, agriculture and food processing, computing hardware and software, electronics, healthcare, IT and ITeS, and many others. These will be put together into various combinations of multi-skilling courses suitable for various grade levels. The choice of multi-skilling courses at all levels, Grades 6–12, can be made on the basis of the economic activity within the local communities serviced by the school. The content and practical aspects of these multi-skilling courses can be woven into the regular school curriculum as part the proposed new National Curriculum Framework for School Education (NCFSE), work on which is already under way.

In secondary school (Grades 9–12), the NEP envisages that most students will continue to take up vocational subjects as a matter of interest and exposure, and to supplement their skills. However, a smaller group will select a specific vocation from the choices available to them and seek to be trained comprehensively in it, with the intention of either moving into specialized TVET institutions such as ITIs and polytechnics after completing Grade 10, or entering the world of work after completing Grade 12. If 25% to 40% of secondary school cohort can make the latter choice – as in South Korea and Australia – train comprehensively in one vocation till NSQF level 4 and then either move out into the world of work or continue into BVoc courses at colleges and universities, this will give rise to a large workforce that is suitably trained in multiple vocations.

The choice of vocational courses that every secondary school can offer up to NSQF level 4 will require careful planning, keeping in mind the requirements for infrastructure for the practical training component of each vocation. The NEP has recommended using the connect to local communities to help identify the vocations that would provide students with meaningful livelihood opportunities locally. Data from skills gaps analysis conducted by NSDC and state governments help identifying such vocations. Educational institutions may also need to conduct skills gap analysis on their own, at the much more granular level of their local surroundings. The work of SANKALP and the DSCs can also help in the preparation of skill gap analysis reports at the district level that can be used as inputs.

As educational institutions take centre stage in their role as TVET providers, management and teachers will have to overcome several challenges of their own to ensure that the promise of TVET is realized.

Above: Young women students conduct experiments at an electronics lab. Nagpur, Maharashtra, India.

Given that each secondary school cannot offer more than a few out of a very large basket of vocational courses, it may be advisable for schools to focus on courses related to Industry 4.0 and greening TVET that are likely to remain in high demand in the foreseeable future. In terms of delivery – particularly of the practical aspects of vocational training – educational institutions will need to turn to local industries and businesses, ITIs, polytechnics, farms, workshops, hospitals, NGOs, artisanal clusters, and other such facilities in their neighbourhoods to identify apprenticeship and internship opportunities for their students. These are not activities that schools generally have experience in, so they will find it challenging. Towards this, there are valuable lessons that India can learn from China. For TVET in China to be in line with industry needs, local enterprises are actively encouraged. For instance, the curriculum of a higher secondary vocational school (Grades 11–12) is designed such that one-third is devoted to general academic skills defined nationally by the Ministry of Education, another third is again nationally defined content associated with a particular occupation, and the remaining one-third is defined with respect to the occupational field but determined locally at the school level with the help of local enterprises (Mehrotra, 2014).

As educational institutions take centre stage in their role as TVET providers, management and teachers will have to overcome several challenges of their own to ensure that the promise of TVET is realized. Courses that offer vocational exposure to students in middle school and beyond will not be difficult to handle since they will be integrated into the curricular framework through the National Curricular Framework for School Education (NCFSE), and the practical work that is required can, in most cases, become part of the science laboratories at school. However, courses for secondary school students who would like to enter the world of work after Grade 12 will require considerable rigour and present a true challenge for educational institutions, since these courses will have to be aligned to the National Skills Qualification Framework (NSQF) levels 1–4 and will include a considerable practical training component. Here, the experience with vocationalization so far in Haryana, Himachal Pradesh and many other states (see Page 76), indicates that it would be better in the long-term if educational institutions prepared to offer vocational education on their own rather than handing over charge to the training partners of the NSDC. Such a move will require a change of mindset and a considerable degree of capacity building among school leaders and teachers. Some of these challenges, such as training teachers to impart the theoretical aspects of the domain knowledge and to assess students is discussed on Page 100, while provisioning of infrastructure for the practical aspects of training students is discussed on Page 96. Other challenges include helping find placement for those students who would like to seek employment after Grade 12.

Vocational education and research through colleges and universities

Skill universities will need to differentiate themselves by contributing to the preparation of curriculum for high-end courses, also at the master's and PhD levels, taking up specialized tasks such as training of teachers, trainers and assessors, and engaging in TVET research.

Universities are the only degree-granting institutions in India at the higher education level, and as such they have a major role to play in scaling out TVET. Many colleges and universities have come forward to offer BVoc programmes in recent years. However, the experience so far indicates that it is necessary to innovate with regard to models of integration of vocational education. The fully integrated model of Dayalbagh Educational Institute (see Case Study 3), the interleaved model of the NUSSD programme at TISS (see Page 66), and the apprenticeship-based partnership model of the School of Vocational Education at TISS (see Case Study 2) have all seen order of magnitude higher enrolments than regular BVoc programmes in most colleges. The present regulatory environment is not very conducive for TISS and other universities to develop innovative models of vocational education, either in a standalone fashion or integrated with mainstream higher education. Fortunately, the implementation of the NEP 2020 is likely to change this situation since it will reduce the regulatory burden on universities and provide considerable autonomy to institutions.

In a survey conducted by TISS-SVE in 2019, students stated that they would prefer the name of the undergraduate degree in vocational education be changed from BVoc to a more regular name such as BSc, indicating their concerns regarding the bias against vocational education in society. This, even though over 52% said that it was easier for them to find jobs relative to regular graduates and 74% said that they had similar or better salaries. The uptake of BVoc courses among tens of thousands of students shows that not only is a Bachelor's degree aspirational in India but also that a degree from a well-known institute such as TISS is attractive. Building on this learning, if at least one state university in each state can adopt the established innovative models of offering vocational education at scale, the number of students graduating with quality vocational education degrees could multiply sharply within the country.

Cognizant of the fact that only universities can provide undergraduate degrees, many states are setting up specialized skill universities that offer TVET courses. There are various models that have been adopted by the states but many of them are putting considerable investment into setting up laboratories and other infrastructure. Given that it takes a decade or longer for new universities to stabilize and build their reputations, the funding set aside by state governments is likely better spent in setting up schools of vocational education at regular universities, the way it has been done at DEI and TISS. Several skill universities are also offering regular degrees such as BSc and BTech to cater to the preference of students. This approach has also been backed by the NEP through its 4-year undergraduate programme with a choice of majors and minors that include vocational subjects. Going forward, given that the NEP encourages all universities to offer vocational education, skill universities will need to differentiate themselves by focusing on developing expertise in specialized areas and specific sectors of the economy, and also through their Master's and PhD programmes. They must also contribute towards the preparation of curriculum for high-end courses and take up specialized tasks such as training of teachers, trainers and assessors, and engaging in TVET research, if they are to create a niche for themselves separate from that of regular universities. Students will in general prefer to access vocational education from regular universities so that they can simultaneously receive a broad-based liberal education.

There is little or no capacity in India for TVET research. Some effort needs to be made to develop research capacity by drawing on international models.

There is little or no capacity in India for TVET research and an effort needs to be made to develop research capacity by drawing on international models. For instance, TVET research in Germany is based on study programmes for the education of TVET teachers in thirteen different vocational disciplines at more than forty universities (Rauner 2009). However, the education of TVET teachers or trainers in India is not as organized as master's degree programmes in the standard vocational disciplines. This could be one of the directions that could be explored by skill universities so that capacity for TVET research can be created over a period of time. The fact that most teachers in vocational subjects at colleges and universities work on contract is also a major deterrent for the advancement of research. Although research on general topics such as human-resource management, lifelong learning, and labour-market research is ongoing, discipline-dependent research in the various sectors of the economy and topics related to pedagogy of TVET are presently neglected. The latter can only come in through the establishment of university programmes for the education of TVET teachers/trainers at the level of master's and doctoral programmes. TVET research is also crucial for shaping labour-market policy, economic policy, and innovation and education policy among others, as well as in the practice of TVET.

Infrastructure belonging to ITIs, polytechnics, PMKKs, tool rooms, CFCs and so on could also be made accessible to school and college students, with appropriate financial models for use and maintenance.

Sharing locally available infrastructure for TVET provision

The approach to physical infrastructure should be to make use of whatever is available within the local community, to the extent possible, at the premises of industry and businesses. Ideally, apart from workbenches and basic computing infrastructure, no new physical infrastructure must be set up in schools unless it is of the high-end variety such as labs for robotics, bionics, and so on, that are not available in the neighbourhood. Funding for the creation of such new facilities can come from the Ministry of Education, but also from the CSR funds of local industries and from philanthropists. This will help ensure that valuable infrastructure is created at educational institutions over time.

The NEP 2020 provides for the creation of school complexes to create a community of teachers that can support each other, and also be a hub of resources, activity and innovation. School complexes are a group of schools, say between fifteen and thirty in number, that offer education from pre-school levels until Grade 12, and are centred around a secondary school that is easily accessible with good road connectivity. State governments will be tasked with grouping all the schools in the state into school complexes. School complexes will not only be adequately resourced with routine equipment such as science laboratories, computing laboratories, and libraries, but they will also be funded to have workbenches specific to some of the vocations that are being taught within the school complex. This will help make these resources available to the largest numbers of students across grades. The facilities at the school complex can also be of benefit to the local communities by providing training for out-of-school youth and adults after school hours.

Locally available infrastructure belonging to ITIs, polytechnics, PMKKs, tool rooms, common facility centres (CFCs) and other facilities belonging to both public and private training providers, could also be made accessible to students from secondary schools and colleges. Sharing resources in this manner calls for formalizing a method for doing so, across the various ministries of the government that own the facilities, and across various types of institutions, something that has not yet been attempted widely in the context of education and training. Some explicit models for doing this will need to be explored. For instance, existing facilities at a particular institution could be made available to other institutions on payment of a modest fee. The funds generated at these facilities can then be used to appoint and pay the wages of coordinators and/or operators of the equipment. Governments, industry and philanthropists can also consider setting up new facilities in the model of the Community Skill Parks in Kerala (see Page 58). MSDE/NSDC can take the lead in creating innovative financial models for sharing infrastructure and work with state governments, district administrations, gram panchayats, and the management of school complexes and higher education institutions, in order to ensure access to students.

Apprenticeships are another way of making use of the physical infrastructure that is already available with industry and businesses. The NEP 2020 empowers the Ministry of Education and educational institutions to work with industry to create models of vocational education that are built around apprenticeships. Students who plan to take up careers in vocations can be given supervised access to high-end equipment available with industry through the widespread adoption of apprenticeships. This move would also bring to the students some of the additional benefits of work based learning (WBL) that go beyond just apprenticeships.

Mobility of students between TVET institutions and mainstream higher education institutions

The neglect of pathways into higher education for students of vocational education in schools has contributed greatly to its low uptake and poor perception. Students require both vertical and horizontal mobility. Technical schools such as the ones in Maharashtra and West Bengal, ITIs and polytechnics provide additional pathways from schools into TVET. Students completing these courses must be able to continue onwards into either technical or vocational education, or even into mainstream general education in related disciplines, at the undergraduate level. Such pathways will ensure that the evolving interests of young students do not trap them into silos. Vertical mobility in either the same discipline or related disciplines, as in the case of graduates from polytechnics entering engineering colleges, is relatively easier to provide than horizontal mobility. The latter can be difficult given that in many cases the mechanisms are not yet defined. For example, if students want to move from a BVoc programme in banking, financial services and insurance (BFSI) into either a BCom or MCom programme, they will require bridge courses. Similarly, a student moving from a BVoc programme in pharmaceuticals into an MPharm programme is likely to require a year-long bridge course. These bridge courses have not yet been defined.

As mentioned on Page 35, the NEP 2020 calls for the creation of a new National Higher Education

Qualification Framework (NHEQF) that defines graduate attributes beyond the National Curriculum Framework for School Education (NCFSE) in school, into undergraduate and post-graduate education. Making the NCFSE and the NHEQF work in tandem with the NSQF, in order to provide seamless mobility to students, will require a credit framework to be associated with the latter. This will also help students accumulate credits towards higher certification. The complexities of defining pathways for vertical and horizontal mobility, defining bridge courses and specifying a credit framework for the NSQF, prompted the NEP 2020 to call for the establishment of the National Council for the Integration of Vocational Education (NCIVE). A range of experts across ministries and educational institutions can be made members of the NCIVE and be charged with looking into these challenges and preparing clear guidelines.

As discussed on Page 48, an additional complication that's introduced with regard to educational institutions is that an entry profile – in terms of grade levels completed – needs to be factored in as an additional parameter. Entry level qualifications for a particular NSQF level, say level 5, may differ from sector to sector. For instance, IT/ITeS requires students to have completed Grade 12, whereas the construction sector accepts candidates who have completed Grade 5. The student from the construction sector who has attained NSQF level 4/5 qualification will therefore not qualify for admission into BVoc programmes that correspond to NSQF levels 5–7. Prerequisites have to be determined on the basis of which admissions into various programmes in higher education, and access to specific courses, can be made, so that institutions can identify the bridge courses that students need and offer them.

Given the complexities involved, the alignment of the qualification frameworks could take a considerable amount of time to be completed. Some other concerns are listed below.

- There is no clear and widely applicable answer to the question whether a student who completes their studies in an ITI and earns an NTC that is equivalent to a Grade 10 or 12, can return to formal education at school or at a polytechnic or in higher education.
- Polytechnics provide long-term training (three years) and students from polytechnics generally seek lateral entry into engineering courses. However, it should be possible for them to also get lateral entry into many other undergraduate programmes, including BVoc and the new 4-year undergraduate programme in the liberal arts. The NEP has also introduced multiple entry and exit options to facilitate such movement but operationalizing them will represent a considerable challenge. In the long term it would be advisable for polytechnics to return to the Ministry of Education so that they can become a part of a new push towards integrated vocational education as a part of the implementation of NEP 2020.

Below: Young women participants developing basic IT skills as part of employability training under AIF's Market Aligned Skills (MAST) programme. Rewari, Haryana, India.

Above: Breaking gender biases, young women train to be electricians under AIF's Market Aligned Skills (MAST) programme. Rewari, Haryana, India.

Placing the learner at the centre of TVET planning and delivery

The philosophical foundation of provisioning TVET programmes for youth needs to be re-examined through the productivity versus capability argument. In general, planners tend to put the needs of industry and employers first, but it is important to reorient thinking towards putting the individual first and focusing on building his/her capability, particularly in rural India. A learner-centric design of TVET programmes needs to be made the new focus of TVET provision, and the aspirations and choices of students must always be centre-stage.

A learner-centric design of TVET programmes needs to be made the new focus of TVET provision. Students must be assisted with exercising their choices, building capabilities and fulfilling their aspirations.

Vocational aptitude tests, career counselling and guidance

As discussed on Page 78, there is a felt need for career counselling and guidance (CCG), and educational institutions must take the lead in providing vocational aptitude tests (VAT) as well as career counselling. If VAT and CCG could also be made a mandatory part of all central and state government schemes for TVET provision, a large number of young people could benefit. Unfortunately, there is not enough expertise available in counselling. Large numbers of teachers/trainers will need to be trained for providing CCG. Counselling will also need to be made available to parents regarding the career options available to their children, so that they can be supportive of their children's choices.

Vocational aptitude tests (VAT) are another key support measure that needs to be made available to all students, either in person or online. Tata Strive has created a picture-based inventory to help students identify their interests and aspirations. PSSCIVE uses an inventory-based method that requires students to write answers to a set of questions. TISS-SVE has taken a different approach by entering into a Memorandum of Understanding with Defence Institute of Psychological Research, New Delhi. The latter provides technical support towards developing aptitude tests that take into account the characteristics of the various sectors of the economy in which courses are being offered (Source: TISS-SVE). Their tool measures capabilities, personality traits etc. that dictate an individual's potential to learn a trade, and scores students. The test is developed through an analysis of real-world work environments (job analysis), so its validity and reliability are likely to be high. The test can be made available online, making it accessible to a large number of students. This online VAT system prepared by

The online career guidance portal made available by UNICEF and the online VAT system prepared by TISS can benefit large numbers of students at a relatively low cost by helping them translate their interests into meaningful career choices.

TISS, coupled with the career guidance portal made available by UNICEF, can benefit large numbers of students at a relatively low cost by helping them translate their interests into meaningful career choices.

State governments can arrange to provide VAT and CCG in all the languages spoken in the state, with information regarding employment and entrepreneurship opportunities available within the state also folded in. Although VAT can be made pictorial to a large extent, administering the test will require interaction with students in local languages. The same is true of the CCG. The possibility of introducing a new specialized course for the training of counsellors also needs to be explored in order to supplement the efforts of UNICEF. Learners must also be assisted with finding employment through the matching of their training with the requirements of employers. The Skill Management Information System ASEEM, recently launched by the NSDC is a step in the right direction.

Holistic education delivery for all learners

All first-generation learners must be provided with a holistic education that is aligned with an appropriate NSQF level, instead of the short-term training that they are receiving at present. This will require creating bouquets of courses that put together training in a particular vocation along with the development of 21st century skills such as creative thinking and problem solving, as well as training towards financial literacy and digital literacy as needed. It is necessary to ensure that the development of competencies is made an integral part of the requirement for vocational education and training conducted by all training providers. Since competencies have to develop as the learner actively engages with a task, learning situations must be designed didactically in such a way that they have a holistic character, comprising planning, execution, evaluation and reflection. Innovative financial models will be needed in order to cover the additional costs of providing such a comprehensive training package to every learner.

ITIs and polytechnics also need to consider revising their curriculum to provide a more broad-based education with a focus on developing competencies in students. They must try and ensure that students are educated using methods of Social and Emotional Learning (SEL). This will not just make them employable but will also make them more resilient to deal with the post-COVID-19 world of work. A stronger focus on the all-round development of learners will help remedy the poor placement rates of ITI and polytechnics alumni as highlighted in the India Skills Report 2020 (ISR, 2020).

Enabling lifelong learning

The Academic Bank of Credits (ABC) proposed by the NEP 2020 has the potential to be a game changer because it will give students the ability to chain credits together and work towards acquiring degrees at their own pace, interspersing work and study as convenient, throughout their lives. When combined with the multiple entry and exit options in undergraduate education that have been proposed in the NEP, this will create a paradigm shift in the way students can study and work throughout their lives. For educational institutions this represents a major departure from the way education has been transacted so far. Management and teachers/ trainers at educational institutions, including TVET institutions, will have to lead the way by ensuring that the opportunity to string short-term courses into diplomas and degrees does not result in loss of academic rigour.

Just as the Academic Bank of Credits is a means of storing the credits earned by students to enable multiple entry and exit through the educational system, as envisaged in the NEP, a similar feature can be envisaged for youth and adults who are outside the formal education system. A Skills Credit Bank or skills card can be created that allows learners to accumulate credits from short-term certificate courses towards higher certifications. The skills card can then be used to track learner life cycles across all the upskilling and reskilling programmes that they go through. Such a skills card would also be in line with current thinking on the greater use of technology in assessment and credentialing in order to enhance the impact of TVET on economic and social development programmes (UNESCO, 2020). The data regarding the progression of learners through life will also enable research on the efficacy and impact of various programmes, as well as on patterns of lifelong learning. Since neither the Academic Bank of Credits nor the kills Credit Bank exist at the moment, they can be designed to be interoperable, enhancing their value further.

Teachers, trainers and assessors

In the longer-term it would be preferable for schools to offer vocational education on their own, by having some of their teachers also teach vocational subjects.

The NEP 2020 empowers management and teachers/ trainers at schools and colleges to collaborate with local industry and businesses to bring a hitherto missing industry connect into education. By emphasizing the need for community connect in school and college education, the NEP brings the focus back on experiential learning, provides students with the opportunity to link their education to their everyday lives, and to apply their learning to address local challenges. The involvement of educational institutions in vocational education will also bring in more know-how and much more attention towards the holistic development of students, towards helping them develop soft skills and competencies over the relatively longer periods they spend at school.

There are two models under which state governments can introduce vocational education at scale into educational institutions. The first is to partner with NSDC and their training partners and entrust them with the complete responsibility of providing vocational education to the students, conducting assessments and providing certification, and also finding placements for interested students, as is being done at present in several states. This model makes use of the physical training infrastructure and trainers available with the training providers so schools don't need to set up infrastructure of their own or hire teachers. The second model is for schools to take responsibility for providing vocational education through inducting vocational teachers/ trainers to train and evaluate students. With regard to access to physical infrastructure, schools can consider a few options. They can choose to use apprenticeships and internships to give students practical training at the workplace or use infrastructure available locally in their neighbourhoods in a shared-use model for providing practical training to students. In both cases they will also need to acquire some local infrastructure, especially computing hardware and software. A large number of teachers, trainers, and assessors will be needed in either model, given the tens of thousands of secondary schools that can potentially be involved.

The choice of whether state governments and school management ought to adopt the second model and employ vocational teachers/ trainers[34] is a complex one given that TVET courses may need to be changed frequently. The requirement for trainers will also depend on whether the school plans to use workbenches on site, or the shared infrastructure that is available nearby, or apprenticeships, for offering practical training to students. However, keeping in mind the fact that vocational education will be an ongoing and sustained activity, and that each school complex will have a large number of associated teachers, it would be preferable in the longer term to invite schoolteachers to volunteer to teach vocational subjects. Teachers who have sound pedagogical training are likely to be better placed to handle adolescents rather than the trainers and assessors brought in by the NSDC training partners. They can be trained through the Training of Trainers (TOT) programmes of the NSDC and PSSCIVE, both of which can be offered online. Specialized teachers/ trainers can also be hired for certain subjects as needed. The vocationalization effort in Haryana has shown that vocational teachers/ trainers are versatile and contribute in many other ways to their schools, such as by teaching additional subjects, managing the laboratories and the ICT infrastructure, and so on.

Having regular teachers offer courses in vocational education will also help overcome the difficulty associated with private sector training providers not having experience with teaching young children and adolescents, given that the present TOT programmes for vocational trainers does not offer training in child psychology and pedagogy. The paucity of adequately trained and capable teachers, trainers, and assessors for TVET is a major handicap that has impacted the quality of delivery of TVET programmes across the board. This is also because teaching, as discussed on Page 80, particularly vocational subjects, is not an attractive career option and does not attract the best talent. Most teachers and trainers are working part-time, and are also working multiple jobs, resulting in high attrition rates. With the integration of vocational education into schools, it is to be hoped that many more long-term opportunities in the form of tenured jobs could open up for teachers/ trainers that could help draw talent into the profession. State governments need to look into improving the working conditions of teachers/ trainers through specifying minimum wages and providing them with benefits and social security. They can also consider requiring all prospective employers to provide teachers/ trainers with standardized wages, raises, and benefits.

TOT programmes need to be expanded and strengthened to cater to the preparation of trainers in the various vocational disciplines. Training modules for prospective trainers can be designed alongside the curriculum for each

[34] The distinction between a teacher and a trainer that is being made here is that the former is someone who has a formal qualification in education, for example a Bachelor of Education degree. Trainers can also be artisans and other practitioners with expertise in the theoretical and/or practical aspects of a vocation.

TVET course. The possibility of introducing TOT courses through the departments of education in colleges and universities can also be explored. The NEP has recommended the use of shorter duration training courses to provide training in pedagogy for candidates who already have credentials in their subject matter and wish to become 'subject' teachers. This will allow persons with industry experience, artisans, healthcare experts and many others who have field experience to serve as teachers/ trainers of vocational subjects.

Upskilling, reskilling, and lifelong learning

Above: Training in progress at the Anbalaya Special School for the Intellectually Challenged under AIF's Ability Based Livelihood Empowerment (ABLE) programme. Chennai, Tamil Nadu, India.

More courses for upskilling, reskilling and lifelong learning need to be made available, at reasonable price points, in areas such as IT/ITeS, Industry 4.0, greening TVET, sustainability and many others that are associated with robust jobs not threatened by automation. The success of the market-led training models in Pradhan Mantri Kaushal Vikas Yojana (PMKVY) II (see Page 51) and that of the FutureSkills initiative of NASSCOM (see Case Study 7) have shown that there are plenty of takers for high-value courses in niche areas. Given the advent of the Academic Bank of Credits for every learner, there is a wonderful opportunity opening up for a new and different type of partnership between businesses and academia, in which high-quality courses offered by private sector businesses can be folded into degrees provided by academia. Early movers such as UpGrad[35] are providing high value courses in strategic areas of Industry 4.0, that have been vetted by regulators such as AICTE as well as premier educational institutions such as IIT Madras. The success of these early efforts only serves to underline the promise.

The NEP also gives educational institutions a tremendous new opportunity to collaborate towards allowing their students to earn additional credits from partner institutions. Premier institutions can opt to run high-quality fee-based courses for upskilling, reskilling and lifelong learning that are offered online, and other educational institutions can allow their students to take these courses towards their final certification. This will make excellent lifelong learning opportunities available for youth and adults and also bring in revenue for the institutions that offer these courses. Similarly, colleges can use their laboratory infrastructure to offer fee-based, in-person courses during evenings, weekends and vacations, to all interested learners. A culture of lifelong learning needs to be nurtured and grown within educational institutions and in society. There is enough of a premium in wages and/or new opportunities in topics related to Industry 4.0 and sustainability, to make paying for such training acceptable to learners. The pandemic has demonstrated this amply with international companies that are offering online education reporting a steep rise in the number of users, including sizeable numbers from India.

The considerable infrastructure created by the NSDC and its partners during the past decade for conducting short-term courses, is already

35 https://www.upgrad.com/

transitioning towards providing high-value fee-based courses for upskilling, reskilling, and lifelong learning. The recent introduction of skill vouchers will help ensure that, over time, training providers who do not offer quality training at competitive prices will get weeded out. Quality assessment frameworks need to be created and used widely to ensure that high standards are maintained in the courses. A strong commitment to accountability and quality of TVET is a pressing need. State governments also need to strengthen the governance and administration of TVET in their states so as to improve the capacity for implementation within the different levels of government. In November 2019, MSDE has operationalized the National Council for Vocational Education and Training (NCVET) that will regulate the functioning of entities engaged in TVET provision and establish minimum standards.

Serving the underserved – Women, PwDs, and other disadvantaged groups

96.2% of the 257 million people in the NEET segment are women and 96.6% have had no formal vocational training. 42% of these women are below the age of 30 and 67% live in rural areas.

Even within India's predominantly informal labour force, women, persons with disabilities (PwDs) and other disadvantaged groups such as Scheduled Castes and Scheduled Tribes (SCs and STs) require special attention. It is troubling that 96.2% of the 257 million people in the NEET (not in education, employment, or training) segment are women, and 96.6% have had no formal vocational training. 42% of these women are below the age of 30 and 67% live in rural areas. More TVET courses need to be designed keeping these underserved groups and their needs in mind, as discussed also on Pages 86–87. Women and youth in rural areas, who are working for very depressed wages due to lack of training or are self-employed, must be given access to training that will help them earn a better livelihood. Similarly, self-employed women and entrepreneurs need to have access to training that is directed towards helping them grow their businesses. Women can also be given the opportunity to complete their formal education through the National Institute of Open Schooling (NIOS).

These women must also be assisted in certification of their skills through the RPL mechanism. The utility of the latter, in counselling, orienting/training and certifying women and other disadvantaged groups cannot be overstated. In spite of a mixed track record, there is evidence to show (see Page 53) that when implemented well, the RPL mechanism can be a powerful way to empower disadvantaged groups, some of whom have seen their average monthly incomes improve by up to 25% as a result of the certification. The mechanism needs to be strengthened further, and the success stories communicated widely, so as to improve perceptions about RPL.

The NSDC makes special efforts to train persons with disabilities. Over 50,000 PwD candidates

ILO's role in upgrading informal apprenticeships: Lessons from Africa

Bringing micro, small and medium enterprises within the ambit of TVET is important especially since in such enterprises, skill transfer takes place mostly in an informal setting and formalization has the potential to improve certain outcomes, if not all. ILO has conducted extensive research and launched several pilots focused on upgrading informal apprenticeship systems in Africa. India can learn from these experiences and create a basis for expanding the current National Apprenticeship Promotion Scheme to include such informal systems.

Source: https://www.ilo.org/skills/pubs/WCMS_171393/lang--en/index.htm

have been trained so far, including 29,700 under government schemes like PMKVY II. It has recently started offering online training programmes for PwDs. Given that PwDs have additional difficulties finding livelihood opportunities, some of the initiatives taken by the NSDC need to be scaled up to reach every PwD. Some of these opportunities also need to be made available in the school sector so that children and adolescents with disabilities can also be provided with training that matches their aptitudes and special abilities. In particular, many children with disabilities (CwDs) will benefit greatly from opportunities for online training, so they must be supported with devices and connectivity as needed. All existing online course content needs to be adapted for use by PwDs and CwDs if they are not already so, and those being created in the future must be required to be compliant with all applicable standards.

NSDC also supports agencies to conduct exclusive job fairs (Divya Kaushal) for PwDs in Karnataka, Tamil Nadu, Delhi, and Assam. It has also customized the needs of PwDs in their SMART and SDMS Portals for providing quality training to them. Many employers are unable to fill the places available under the 3% reservation for PwDs. Mapping vacancies, identifying the skills needed and providing such training will help greatly. NSDC also supports the National Abilympic Association of India for organizing national and international skill competitions for PwDs.

Most of the informal training that workers in the informal sector receive are through unpaid apprenticeships, mentorships, and other methods of work based learning (WBL) such as shadowing and team based learning. However, the National Apprenticeship Promotion Scheme (NAPS) does not extend to this sector since it has not been designed keeping the requirements of informal workers in mind. It is largely meant to place candidates into formal apprenticeships and only MSMEs having 30 or more employees have been included in the scheme. However, of the 63.4 million MSMEs in the country, nearly 63 million are micro enterprises employing a total of 110 million employees – an average of less than 2 employees each. Skill vouchers that cover their cost of living can help prospective apprentices choose where they would like to apprentice. The MSDE needs to make a major push towards supporting apprenticeships and work based learning in the informal sector.

The mainstreaming of vocational education into school and higher education as part of the NEP will also help address, in the long term, the issues of inclusivity to a very large extent. Students will get a much more broad-based and competency-based education while they are still in school, preparing them well for life and for the world of work. In the longer term, it would also be ideal if secondary schools are entrusted with the responsibility of using the infrastructure at school complexes for adult education, in line with the NEP. They could run meaningful vocational training programmes for members of the local community, particularly women in the NEET segment, after school hours.

Most of the informal training that workers in the informal sector receive are through unpaid apprenticeships, and other methods of work based learning such as shadowing and team based learning. The MSDE needs to make a major push towards supporting apprenticeships and work based learning in the informal sector.

Opposite page Visually impaired trainee (in white coat), practises body massage therapy techniques under AIF's Ability Based Livelihood Empowerment (ABLE) programme. Delhi, India.

The induction of technology and digitalization of TVET

Teacher competencies represent systemic challenges to the adoption of digital TVET.

A joint report by ILO and UNESCO identifies several systemic challenges to the adoption of digital TVET that are independent of the pandemic (ILO–UNESCO, 2020). Among these, teacher competencies is one of the most serious. In India, teachers have received little or no training in online education, but when the pandemic forced school closures and an emergency response in terms of moving education online, most teachers rose to the challenge. In the ensuing months, they have continued with online education as best as they can. TVET is presently being taught by trainers who receive some induction training, but not sufficient to cover important topics such as pedagogies in the digital domain, the creation of active content, online assessments and so on. Given that online education is here to stay post the pandemic, all teachers and trainers need to be provided with high-quality training in online education that includes training in content creation, use of Open Educational Resources (OER), Learning Management Systems (LMS) and so on. They must also be given access to shared digital repositories so that they can engage in the collaborative production and use of digital content.

Digital skills are driving competitiveness in the economy today, and digitally supported models of education and training can make learning more flexible, help strengthen individual skills and competencies, and enhance the quality and attractiveness of TVET. Since the larger part of TVET is practical hands-on training, at least some part of this training cannot be brought online. However, this hands-on training component can be supplemented to great effect through the creation and use of a bank of training videos that demonstrate the key principles and the desired outcomes from practical training. An important target therefore, is the creation of adequate digital content for supplementing and reinforcing the practical training of students in this way. Many countries are making innovative use of digital content to supplement practical training. Digital training material is also extremely valuable for very high-tech work since it can help orient students to what is expected of them in special situations such as when the practical work calls for considerable skills, or uses very expensive or delicate equipment; or involves working with human patients such as in the healthcare sector and so on.

Millions of MSMEs and their workers are in distress due to the pandemic. TVET that leads to decent work and livelihoods can help mitigate some of this and also offer benefits beyond the pandemic. The NSDC is facilitating the online acquisition of skills through the eSkillIndia portal. Many of the courses are free to the user provided they have access to devices and connectivity. However, the present catalogue of 400 courses needs to be expanded considerably so that more people can benefit. Banks of high-quality video-based training material, simulations, games etc. could be generated through crowdsourcing and the material put through a careful curation process before making it available for widespread use. Similar repositories of content, created by experienced persons in industry and academia, can support online training of teachers/trainers. Testing and credentialing can also be done online. The FutureSkills initiative of NASSCOM (see Case Study 7) is exactly such a digitalization model.

Right: Trainees undergo online training at Learnet Skills. COVID-19 has shown that digital skills are more important that ever before, not just for learners but also for teachers and trainers. Okhla, New Delhi, India.

Preserving, protecting and promoting India's rich cultural heritage has the potential to support many jobs. A new Sector Skill Council for Culture that can design and deliver the requisite TVET courses needs to be set up at the earliest.

Top: Patachitra scroll paintings –practiced in West Bengal and Odisha and depicting mythological and folk tales – being narrated by artists in form of songs. West Bengal, India.

Preserving and promoting India's tangible and intangible cultural heritage

A mission-mode effort needs to be launched to create a large workforce for preserving, protecting and promoting India's rich cultural heritage that includes several UNESCO World Heritage sites and a vast array of intangible cultural heritage. Both the tangible and intangible cultural heritage are sectors that are amenable to supporting many more jobs than they do at present. The possibility of creating a new Sector Skill Council for Culture that can design and deliver new TVET courses in this very special sector is an excellent idea that needs to be brought to fruition at the earliest.

Many archaeological sites are in a dilapidated condition. The preservation and protection of such tangible cultural heritage requires a multi-pronged approach to the preparation of a workforce. All aspects of the heritage sites, beginning with their history, the art and craft of preserving them, protecting them from erosion and from miscreants, and presenting them to the visiting public, require different types of trained personnel, and appropriately designed courses can be created for training them. Innovative financial models that can help run all the tangible heritage sites sustainably using the revenue generated from tourism – post the initial investment by the government – would be ideal. State governments will need to make the initial investment. A special effort needs to be initiated to raise funds and create a corpus to supplement state government funding towards initial preparation of the sites.

India's intangible cultural heritage – that includes arts, crafts, sculptures, textiles, Indian knowledge systems including plants and forestry, Ayurvedic medicine and so on – must be preserved and grown. To this end, enterprises based on these heritage skills must be provided with access

to credit and market linkages as needed. Most of the products are created in family-owned enterprises, in a few million micro and nano enterprises that are concentrated in a few thousand artisanal clusters (Sarkar et al., 2020). The artisans are informal workers who learn their basic skills from family members, through apprenticeships and other forms of work-based learning. But they require training in business aspects such as finance, sourcing of quality raw materials, market promotions, design, e-commerce, technology upgradation and mechanization and more, so that they can generate higher incomes that are also more sustainable. The One District One Product (ODOP) programme of the Uttar Pradesh government (see Pages 58–59) provides such support for the products in each of the state's districts, and is a model worth emulating. Artisans can also be assisted with creating self-help and joint liability groups as necessary, as has been done for members of the Rickshaw Sangh by the American India Foundation (see Case Study 8 on Page 110).

Some of the Jan Shikshan Sansthans (JSSs) are also engaged in preserving the intangible culture of their local communities, so they should also be included in any effort to strengthen intangible cultural heritage. Warli painting, bamboo work, zari work, embroidery, mirror work and so on are some of the arts and crafts they are engaged in, making products largely for local consumption. Many of these JSSs and artisanal clusters also have the potential to develop into tourist hubs, given that homestays and other innovative ideas for tourism in rural India are taking hold.

Top: Dokra craft is one of the earliest methods of non-ferrous metal casting, and can be traced back to the Indus Valley civilization. It is practised in India's Odisha, West Bengal, Chhattisgarh and Andhra Pradesh states. Dokra has received the Geographical Indication (GI) tag. Government of West Bengal's Department of Micro, Small and Medium Enterprises & Textiles, in association with UNESCO, has developed the Rural Craft Hub in Bikna, which is now home to approximately 296 artisans.

Improved TVET delivery through greater focus on the Sustainable Development Goals

The COVID Pandemic has led to greater awareness of environmental and sustainability issues among the general public in India, and presented an opportunity to leverage the same in order to re-imagine the way we target and achieve the 2030 Agenda for Sustainable Development. It has forced people to rethink their lifestyles and priorities, and this is likely to be reflected in changes in consumption patterns. GDP will likely cease to be the only measure of development. It is already being supplemented, at least in some countries, by a well-being or happiness index of some kind – such as the Gross Happiness Index in Bhutan, or the Better Life Index defined by OECD countries – as more people prioritize mental health and family cohesion over a single-minded focus on productivity at the workplace and profits.

These changes will shift the requirements for TVET, with some sectors slowing or closing down and new ones such as greening TVET emerging stronger. The 2030 Agenda for Sustainable Development provides us with a comprehensive framework for creating new TVET courses on water management and sanitation, clean energy and many other aspects of sustainability and climate change. The focus on achieving targets associated with the SDGs must remain central to efforts at TVET provision in the future.
The pandemic has also brought the focus back on issues related to core human capital – such as lack of livelihoods and access to healthcare – and also on issues of equity, especially gender equity.

Education for Sustainable Development

Education for Sustainable Development (ESD), a term coined by UNESCO, seeks to promote a sense of local and global responsibility, encourages future-oriented, anticipatory thinking, builds recognition of global interdependence and emphasizes cultural changes that embrace the values of sustainable development (Lamichhane and Echaveria, 2017). A 'whole-institution' approach to ESD outlined by UNESCO (UNESCO, 2014) suggests the incorporation of sustainable development not only through the curriculum, but also through an integrated management and governance structure of the institution, the application of a sustainability ethos, engagement of community and stakeholders, long-term planning, and sustainability monitoring and evaluation. It suggests the following ways to implement this at the institution level:

- By having all stakeholders – leadership, teachers, learners, and administration – jointly develop a vision and plan to implement ESD in the whole institution.
- By providing technical and financial support to the institution for this reorientation, training for leadership and administration, development of guidelines, and associated research.
- By mobilizing and enhancing existing inter-institutional networks to facilitate mutual support such as peer-to-peer learning, and to increase the visibility of the approach as a model for adaptation.

These suggestions are reflected in the NEP 2020, in the creation of school complexes towards forming a community of teachers, leaders, administrators and students who can all support each other and make decisions autonomously – for the complex as well as for individual schools within the complex – and can also share resources among themselves. The NEP also recommends that schools and colleges develop strong connections with their local communities that can be leveraged to provide students with experiential learning opportunities. ESD gives a new purpose to education systems by aiming to improve access, retention and delivery of relevant knowledge, skills, values and perspectives; and reorienting existing disciplines, programmes and outcomes so as to change unsustainable practices at all levels. Through the incorporation of ESD in the new curriculum frameworks, Indian schools and colleges will be able to take their places at the forefront of such efforts.

Below: Participants at the Greening TVET workshop conducted by UNESCO-UNEVOC and NSDC. Greening as an aspect of TVET would play an important role in attainment of many SDGs. Aerocity, New Delhi, India.

Greening TVET and aligning with the SDGs

24 million jobs could be created globally by 2030 via a shift to a greener economy, according to ILO estimates.

TVET contributes to sustainable development by empowering individuals, organizations, enterprises and communities and fostering employment, decent work and lifelong learning so as to promote inclusive and sustainable economic growth and competitiveness, social equity and environmental sustainability (UNESCO, 2016b). Learners are equipped with the knowledge, skills and competencies they need to effect necessary change and perform their roles to the point that sustainability is embedded in everything they do.

Green jobs, as defined by ILO refers to employment in industries that contribute to preserving or restoring environmental quality and allowing for sustainable development. These include:

- Protecting ecosystems and biodiversity.
- Reducing energy, materials, and water consumption.
- De-carbonizing the economy.
- Minimizing generation of all forms of waste and pollution.

In its World Employment and Social Outlook report of 2018, ILO analysed 163 sectors of the economy and concluded that 24 million jobs will be created worldwide by 2030 if the right policies to promote a greener economy are put in place (ILO, 2018). New jobs will be created by adopting sustainable practices in the energy sector including changes in the energy mix, promoting the use of electric vehicles and improving the energy efficiency of buildings. The report calls on countries to take urgent action to train workers in the skills needed for the transition to a greener economy, and provide them with social protection that facilitates the transition to new jobs, contributes to preventing poverty and reduces the vulnerability of households and communities. India has responded by taking action to anticipate the skills needed for the transition to greener economies and providing new training programmes.

Greening TVET needs to be a priority in TVET provision in India, particularly in sectors such as agriculture and food, construction, energy, mining and manufacturing that are a threat to the attainment of the SDGs. All the five dimensions of the green transformation in TVET recommended by UNESCO – including greening the campus, greening of curriculum and training, greening community and workplace, greening research, and greening culture – needs to be adopted by communities (UNESCO, 2017). The NEP can support educational institutions in adopting a holistic approach towards sustainable development through greening TVET – through the curriculum and courses that are made available to students, and through the engagement of all stakeholders in long-term planning and implementation of sustainability initiatives, backed by monitoring and evaluation, towards the realization of green campuses and a culture of greening all round. Initiatives that are already underway – such as incorporating greening concepts in the curriculum developed by PSSCIVE, and the creation of green campuses and buildings – need to be accelerated. The pandemic accelerated the use of the digital medium. If the alignment with the SDGs could also be similarly accelerated, then it would be a welcome outcome of the crisis.

Right: Practical training in progress at Indraprastha Academy Pvt Ltd – a learning partner of TISS-SVE – for BVoc students of Renewable Energy Technology. Noida, Uttar Pradesh, India.

Top: AIF's Rickshaw Sangh beneficiaries with their rickshaws. Rickshaw Sangh is a unique financial inclusion programme transforming rickshaw pullers into asset owners. Firozabad, Uttar Pradesh, India.

Innovative models of financing TVET

Development impact bonds (DIBs) are a novel way of financing in which the funding is tied to outcomes and works through the collaboration of three key stakeholders. These are a primary 'risk' investor, a service provider, and an outcome funder. The primary investor provides working capital to the service provider and once the agreed upon outcomes are achieved, the outcome funder compensates the primary investor for the funding along with returns. NSDC is launching the Skill India Impact Bond (SIB) which will be focused on translating skilling into large-scale paid employment, especially for women (Source: NSDC). The SIB will be launched in partnership with the British Asian Trust with a value of approximately US$15 million and will build on the significant efforts by the Government of India and the NSDC towards catalyzing the skilling ecosystem. The need for such an effort is more urgent due to the pandemic and will be addressed by adopting a pay-for-outcomes SIB with the objective of institutionalizing an outcomes-focused approach, innovations, and learnings in the national skilling ecosystem. Key focus areas will include:

- Greater focus on placement and retention: Increasing placement outcomes and achieving retention for 3 months for a substantial number of those placed in jobs.
- Shift in incentive structures: Bringing a pay-for-performance mindset in the system by skewing payments towards placement and 3-month retention.
- Improved transition rates: Incentivization of outcomes could increase efficiency in the value chain by reducing dropouts across different stages.

The overarching objective of institutionalizing an outcomes focus is valuable in the Indian context and must be adopted more widely in the country, not just in the context of short-term TVET programmes but also in the forthcoming efforts of educational institutions.

A financing model for the creation and use of shared infrastructure is also urgently needed. The budget of some of the centrally sponsored schemes for short-term skilling can be spent on setting up infrastructure that is designated for sharing by all training providers including educational institutions. The Kerala government's model of Community Skill Parks is an excellent example of setting up just this kind of shared high-end infrastructure. Common Facility Centres (CFCs) and Tool rooms[36], set up by the Ministry of MSMEs, and facilities belonging to other ministries can also be shared in the same way. The model for shared use can be made sustainable by generating sufficient funds for maintenance of the facilities and to pay staff who keep the centres running.

[36] https://msme.gov.in/brief-about-msme-tool-rooms

CASE STUDY 8

American India Foundation: Rickshaw Sangh (RS) programme

The number of rickshaw pullers in India is estimated to be around 15–20 million. Despite the importance of rickshaws in serving the transport needs of people, rickshaw pullers are one of the most disadvantaged sections of the society. The American India Foundation (AIF), recognizing the plight of the rickshaw puller community and their need for financial inclusion, launched the Rickshaw Sangh (RS) programme in 2007. The RS programme is unique in that it combines the principles of micro-credit and financial inclusion to support mainstream financial institutions in bringing about asset creation for the rickshaw pullers, and is based on the principles of profitable lending. In the decade since its launch, the RS programme has reached out to over 120,000 rickshaw pullers, impacting over 600,000 lives.

PROGRAMME DESIGN

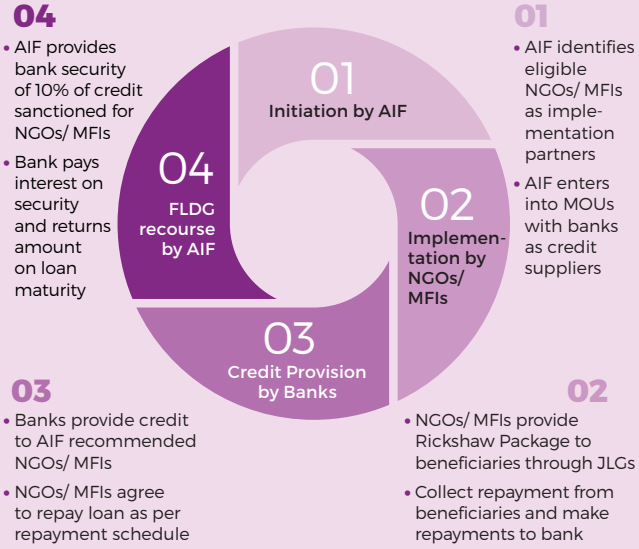
The RS programme is designed to work at three levels.

1. **AIF identifies NGOs/ MFIs to implement the RS program** — At the initiation level, AIF identifies and partners with Non-Government Organizations (NGOs)/ Micro Finance Institutions (MFIs) to implement the programme tenets for the rickshaw pullers.
2. **AIF provides FLDG to Bank who lend to NGOs/ MFs** — At the funding level, banks offer loans to the AIF partner NGOs/ MFIs, in return for a security in the form of FLDG from AIF.
3. **NGOs/ MFIs form JLGs and offer Rickshaw Package to members** — At the ground level, the NGOs/ MFIs organize the rickshaw pullers into JLGs, extend the Rickshaw Package to the beneficiaries, and are responsible for collection of repayments.

The RS programme, with First Loss Default Guarantee (FLDG) support from AIF, offers a value proposition to all banks in India, and banks can adapt the programme to align with their objectives, outreach and capabilities. The RS programme is a complete package of finances and services. It provides the beneficiaries with a holistic solution for asset ownership leading to a sustainable source of livelihood and all the associated economic and social benefits.

An impact assessment of the programme conducted in 2016 at Sitapur district of Uttar Pradesh by M2i Consulting makes the following observations:

PROGRAMME IMPLEMENTATION



- **Income generation**: After becoming owners under the Rickshaw Sangh program, rickshaw pullers saw an 82% overall increase in income (Rs 4,289 to Rs 7,790 a month).
- **Exemption of rent**: A direct impact has been the elimination of the daily rickshaw rent which used to be almost 25% of the daily income. Although rickshaw pullers do have to pay the equated monthly instalment (EMI), the interest on the loan is significantly lower than the rent – a single month's rent was almost equal to the interest paid for the entire tenure of the loan.
- **Formalization of working conditions and reduction in harassment**: The rickshaw package, which also provides license and permits, has resulted in significant reduction of regular harassment, penalties and loss of work amongst rickshaw pullers, This has also helped reduce overall stress and an improved working conditions.
- **Financial inclusion**: Under the programme, the rickshaw pullers had to open a bank account under the Jan Dhan Yojana. They were also provided social security through enrolment in the Pradhan Mantri Suraksha Bima Yojana, Pradhan Mantri Jeevan Jyoti Bima Yojana and Atal Pension Yojana. As a result, they had access to bank accounts, insurance and pension services.
- **Gender balance**: The rickshaw package is designed in a way that women are the primary borrowers and owners of the asset. This helps in creating a subtle social impact and gender equality.

Source: 'Financial Inclusion of India's Rickshaw Pullers, 2019'. American India Foundation Report.

Innovative financial models also need to be devised for addressing the pernicious problem of the lack of social security for well over 90% of Indian workers, including trainers and assessors in TVET. The government has recently announced labour codes[37] that aim to address this issue, but it is very early days yet and it remains to be seen if they are adequate and will be implemented soon. In this context, the model for providing financial assistance to rickshaw pullers by the American India Foundation (AIF) represents a very innovative financing model. The intervention by AIF helped rickshaw pullers own their rickshaws rather than rent them. This not only gave them higher incomes but also access to bank accounts, insurance and pension services. The model engages NGOs and MFIs as intermediaries that organize rickshaw owners into joint liability groups (JLGs), receive loans from the banks, disburse it to the owners and also collect payments, with AIF providing the First Loss Default Guarantee (see Case Study 8).

Skill vouchers, announced recently by the government, will go a long way in bringing market forces to bear on poor quality courses and providers. In line with this vision, the NSDC has given out the first set of skill vouchers in January 2020. Providing vouchers to learners will enable them to exercise choice which will in turn put pressure on training providers to improve the learner experience. TPs will need to identify skills that are currently in demand and make linkages with employer organizations to improve the placement rates of their trainees, thus creating a more vibrant interface between vocational training and industry. With skill vouchers, TPs will also need to rely more heavily on good trainers to help attract learners, inducing them to invest more in their trainers.

TVET research

TVET research is directly related to the shaping of the transition from education to the employment system (Rauner, 2009). It can cover a broad range of issues beginning with reflections on the foundations of TVET and its various contexts such as historical, geographical and the labour-market, and leading up to the shaping of the provision of skills. TVET research can lead to policy recommendations or be used for the development of systemic elements such as teacher education and curriculum development. It can foster innovation at the level of TVET provision and support the dissemination of accurate knowledge to various stakeholders. TVET research in India is very sparse today but is likely to grow as the number of universities and colleges that are engaged in the provision of TVET increases.

There are several questions that need to be researched in India today since they have an immediate bearing on the manner in which the country will proceed with the integration of vocational education into schools and colleges. For instance, according to the findings of a comparative study of eleven European TVET systems (Rauner, 2009), countries with a dual model of apprenticeship training are distinctly more successful in organizing the transition of young people who have completed vocational education, into the employment system, whereas in countries with a school based TVET system, youth unemployment is at a much higher level. This result and the applicability of the associated research in the Indian context is very relevant given the stage at which India is in with regard to integrating TVET in schools.

Digital transformation will have an extensive impact on TVET and labour markets in India. TVET systems have to innovate and adapt to technological progress and TVET researchers must generate knowledge which will be conducive to development. In this context, some of the key questions that need to be researched on a sustained basis include:

- The erosion of different types of work and how TVET systems must respond to stay ahead of the curve and train people for knowledge economy jobs that are more stable.
- The quality of education and the didactic approaches that need to be established to achieve the right conditions for competence development in schools and colleges, and for lifelong learning.
- How vocational teachers in schools and colleges and in-company trainers should be educated and trained so that they can act as agents of change and help achieve the goal of quality TVET for all.
- The emergence of transnational labour markets that necessitate the internationalization of occupational development and the enabling of mobility for Indians.
- Other systemic questions such as the interaction between the TVET system and the employment system, the permeability between general and vocational education, the evaluation of various training programmes, the tracking of student life cycles and so on.

[37] https://labour.gov.in/labour-codes

Findings from a comparative study of eleven European TVET systems show that countries with a dual model of apprenticeship training are distinctly more successful in transitioning young people into the employment system.

Well-researched approaches to questions is reliant on authentic data that is gathered continuously and analysed. Take for example the question of the model of TVET provision in India transitioning from being supply driven to demand driven. Despite considerable effort towards training workers to be industry-ready, there appears to be a mismatch, resulting in large scale unemployment or underemployment. While such a conclusion may be true overall, it is difficult to establish its veracity without rigorous empirical analysis of data which is gathered routinely in all projects and made available to researchers in a suitably anonymized fashion. The latter would create an opportunity for researchers to help enable data-driven decision making. Given India's size and heterogeneity, and the stage of TVET provision that it is in at the moment, there can be a lot of data and myriad opportunities for meaningful research, provided researchers are given access to suitably anonymized data for analytics. The output of such research can be used as inputs for future policy making, or to adjust policy implementation as needed.

Of course, research is only possible when there is funding set aside for it, and when there is a vibrant community of researchers willing to engage with questions of interest. At present, most immediate research needs are being met by the NSDC, and the academic community is not very involved in TVET research. Teachers and trainers at higher education institutions, particularly skill universities, need to be encouraged to engage in TVET research. The situation with funding is likely to improve soon since the NEP proposes to create a National Research Foundation. It will seed and grow research in universities and colleges through the provision of adequate funding based on peer-reviewed proposals along with mentoring by seasoned researchers. The National Skills Research Division (NSRD) of the National Council for Vocational Education and Training (NCVET) is also charged with conducting research.

The standing of vocational education in the context of national education systems is of crucial importance for the future development of TVET research. It remains to be seen whether the integration of vocational education into universities will help TVET research grow.

Collaboration and partnerships for quality TVET at scale

The NEP 2020 encourages all schools and colleges to offer TVET courses that are aligned to the needs of local economies and can benefit local communities. Educational institutions need to accept the challenge, adopt new ways of thinking, and work with all stakeholders towards bridging the gap between the demand for and supply of a skilled workforce. The MoE is also likely to face several challenges in successfully implementing this major reform. These include:

- Lack of know-how among key stakeholders in the government as well as leadership and teachers at educational institutions.
- Lack of robust mechanisms for inter-ministerial collaboration which makes it difficult to utilize the know-how and the vast infrastructure for TVET provision available with the MSDE, as well as industry linkages.
- Lack of institutional memory due to frequent changes in leadership of individual ministries as well as within their bureaucracies. This inhibits long-term planning, coordination and delivery of TVET.

Keeping these challenges in mind, the NEP 2020 has committed to set up a National Council for Integration of Vocational Education (NCIVE) comprising experts in vocational education and representatives from across ministries and from industry, to oversee the integration effort and to share successful models and best practices to help extend the reach of vocational education. The idea of finding and sharing successful models and best practices is significant since it will address the lack of know-how among stakeholders and speed up the uptake of vocational education. NCIVE can also track the implementation on ground and gather feedback data towards agile and data-driven decision making. As discussed also on Page 97, NCIVE can be given the mandate to support all activities that require coordination across ministries, such as the alignment of qualification frameworks, the guidelines for the framing and use of bridge courses, and even mechanisms for pinning responsibility and ensuring accountability for outcomes. In this way NCIVE can create, hold, and make use of the institutional memory

Opposite page : Youth learning hospitality industry skills under AIF's Market Aligned Skills (MAST) programme. Hyderabad, Telangana, India.

Below: Young women gets hands-on practice at the practical aspects of geriatric care training at the AIF centre. Noida, Uttar Pradesh, India.

generated through the entire integration effort.

There is near zero accountability for poor outcomes among stakeholders responsible for implementing TVET programmes. This is partly because most policy implementations only set up a limited feedback loop by design, to test if the policy is having its intended impact. The intended beneficiaries of the policy are rarely consulted or involved with evaluation of outcomes. Going forward, the NCIVE can ensure that policy implementation includes provisions for continuous feedback gathering and leveraging of data to monitor progress, assess challenges and bottlenecks, and evaluate successes and failures. Research, data-gathering and analysis of the progress of initiatives, will help establish the culture of using feedback to adjust implementation plans as needed, and of fixing accountability towards ensuring successful outcomes.

The NSDC and the PSSCIVE are two other institutions that have been providing inter-ministerial coordination not just between the MoE and the MSDE in the context of vocationalization of school education, but with several other ministries that have been using the NSDC and its ecosystem – SSCs, training partners, and industry linkages – for their own skill development efforts. PSSCIVE has also had a very important role in helping TVET grow within educational institutions. It has been working in conjunction with the SSCs to create curriculum in many sectors of the economy and in training of trainers. PSSCIVE must be grown and strengthened considerably so that it can also serve as a bridge between MoE and the MSDE/ NSDC ecosystem. These institutions can also be brought in to address other challenges such as devising methods for sharing infrastructure, discussed on Page 96, through innovative administrative and financial models.

State governments can consider using the mechanism suggested in the Draft National Education Policy 2019 (DNEP, 2019) of creating a standing State Education Commission comprising representatives from all stakeholder groups – including eminent educationists from civil society – to assess outcomes of implementation and interact with students, parents and teachers to ensure intended outcomes are achieved (DNEP, 2019). The departments of school and higher education in each state, the state skill development mission, as well as all other concerned ministries could be represented in the commission as needed.

Right: A young aspirant refines her skills at a practical session of beauty culture training under AIF's Market Aligned Skills (MAST) programme. Rewari, Haryana, India.

Facing page: A young woman hones her skills in stitching and tailoring at a garment construction course under AIF's Market Aligned Skills (MAST) programme. Rewari, Haryana, India.

Summary

The NEP 2020 regards the integration of vocational education into mainstream school and college education as the most optimal way to prepare students for life and livelihoods. Educational institutions can offer a broad-based liberal education which includes the acquisition of skills and competencies in a particular vocation combined with building character and personality traits, offered within a social and emotional learning environment that prepares students to take on the long-term challenges of life and work.

The NEP provides exposure to multiple vocations for every student, beginning in middle school (Grades 6–8) and beyond, through various combinations of multi-skilling courses that are suitable for various grade levels. In secondary school (Grades 9–12), it envisages a smaller group of students taking up a vocation with the intention of moving into either specialized TVET institutions or entering the world of work. If, as in South Korea and Australia, 25% to 40% of the secondary school cohort make this choice, the result would be a large, skilled workforce.

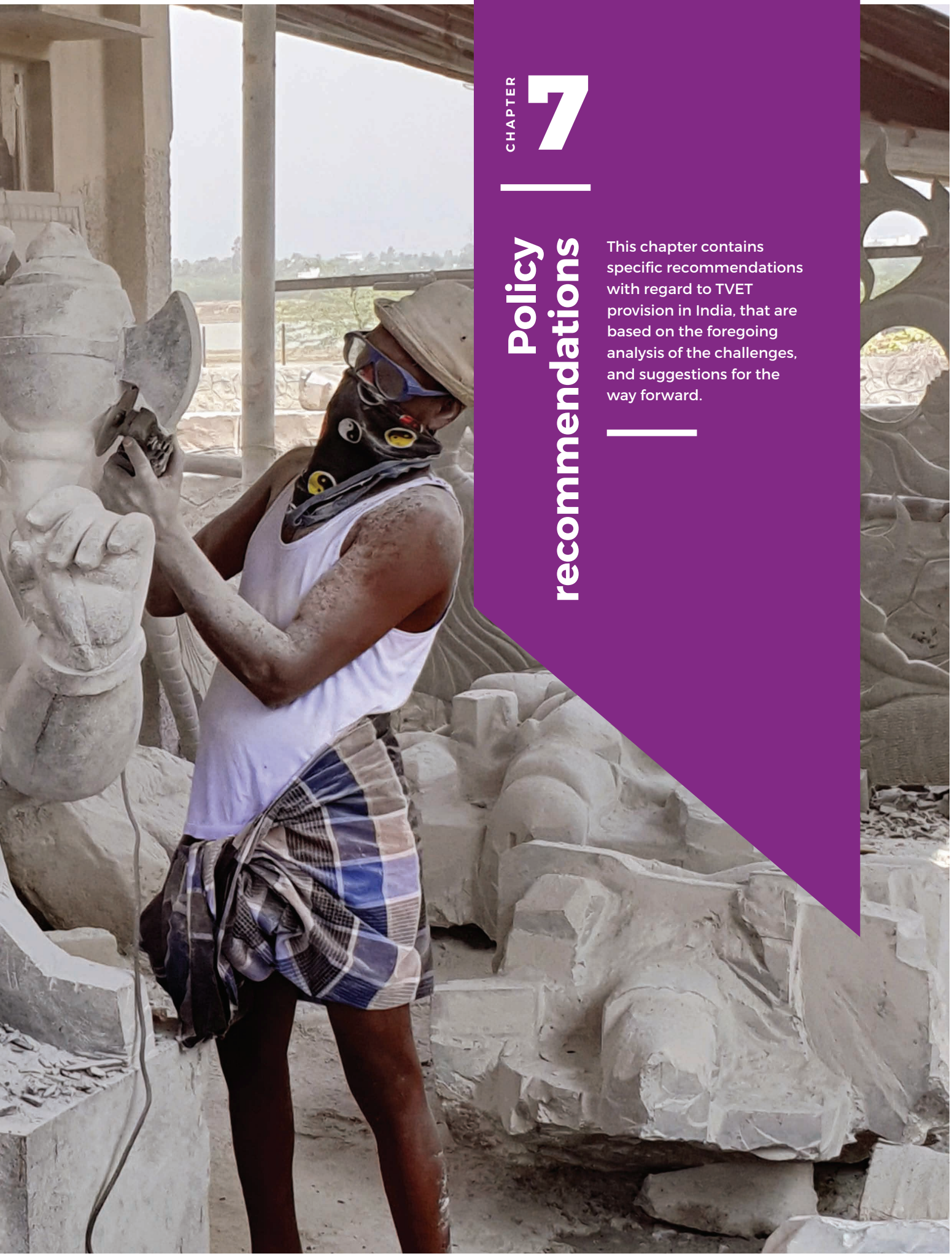
As educational institutions take centre stage in their role as TVET providers, management and teachers will have to overcome several challenges of their own to ensure that the promise of TVET is realized. Teachers will need to adopt a can-do attitude, accept the challenges and get trained themselves on all aspects of TVET, so that they can be learner-centric in course design and delivery, and also help students with career guidance and counselling.

Several innovative models of integrating vocational education into higher education – such as the fully integrated model of Dayalbagh Educational Institute, the interleaved model of the NUSSD programme at TISS, and the apprenticeship-based, partnership model of the School of Vocational Education, also at TISS – have all seen order of magnitude higher enrolments, several thousands of students, than regular BVoc programmes. Their success indicates that any approach to scaling the integration of vocational education, at both regular and skill universities, must keep value addition for students foremost in their planning.

The mainstreaming of vocational education into school and higher education as part of the NEP will also help to address the issues of inclusivity to a very large extent. Secondary schools can also be entrusted with the responsibility of training members of the local community – out-of-school youth and adults, particularly women – after school hours, using the infrastructure available at school complexes.

CAPITALIZING ON INDIA'S CULTURAL HERITAGE

Stone sculptor uses modern grinding tools. The best way to preserve traditional skills is to transfer them to the next generation. Tamil Nadu, India.



CHAPTER 7

Policy recommendations

This chapter contains specific recommendations with regard to TVET provision in India, that are based on the foregoing analysis of the challenges, and suggestions for the way forward.

7 Policy recommendations

Recommendation 1
Place learners and their aspirations at the centre of vocational education and training programmes.

Learner-centric programme design needs to be the new focus of TVET provision in the country. Learners require assistance in exercising choice, building up capability and fulfilling their aspirations. Several steps need to be taken to this end:

- Vocational aptitude tests coupled with career counselling and guidance are key support measures that need to be made available to all learners.
- First-generation learners, particularly those who are not in employment, education, or training (NEET), need to be offered courses that provide not just hands-on training in a particular job/ trade, but a more holistic education that is aligned with an appropriate level of the National Skills Qualification Framework (NSQF).
- Skill vouchers need to be made the norm, along with a quality assurance framework, so that learners can exercise choice in course selection and the quality of courses improves.
- A Skills Credit Bank or Skills Card needs to be created that is interoperable with the Academic Bank of Credits proposed in the National Education Policy (NEP) so that learners can accumulate credits towards higher degrees as a part of lifelong learning.
- Pathways into higher education must be available to all students of vocational education. Vertical and horizontal mobility, along with the necessary bridge courses, need to be worked out by harmonizing the use of appropriate qualification frameworks.

Recommendation 2
Create an appropriate ecosystem for teachers, trainers and assessors.

State governments and school management may consider employing vocational teachers/ trainers in secondary schools rather than making use of training providers of the National Skill Development Corporation (NSDC) as is being done at present. Since vocational education will be an ongoing and sustained activity, it would be preferable in the longer term to invite trained schoolteachers to volunteer to teach vocational subjects. Teachers who have sound pedagogical training are better placed to handle adolescents than the trainers and assessors associated with NSDC training partners.

Teachers can be trained through either regular in-service teacher training programmes or through the Training of Trainers (TOT) programme of the NSDC and the Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE), both of which need to be strengthened and offered online. The possibility of introducing master's level teacher preparation courses in vocational disciplines at regular and skill universities also needs to be explored. The NEP recommends the use of shorter duration training courses in pedagogy to train persons with industry experience, artisans, and other experts with field experience as teachers/ trainers of vocational subjects.

The career prospects of teachers, trainers, and assessors, their terms of recruitment and working conditions need to be given careful attention. Unless teaching becomes an attractive and aspirational profession, the quality of TVET programmes will not attain the desired high standards. Governments need to consider requiring all prospective employers to provide teachers/trainers with standardized wages, raises and benefits.

Above: Soft skills training including spoken English in progress as part of AIF's Market Aligned Skills Training (MAST) programme. Rewari, Haryana, India.

Recommendation 3
Focus on upskilling, reskilling and lifelong learning.

The Academic Bank of Credits (ABC) for every learner, proposed by the NEP, gives educational institutions a tremendous new opportunity to collaborate among themselves and allow students to earn credits from partner institutions. It also creates a similar wonderful opportunity for a new and different type of partnership between industry and academia, where credits for courses offered by private sector companies and vetted by regulators and academic institutions, can be folded into degrees provided by the academic institutions.

The considerable infrastructure for short-term training courses that has been created by the NSDC and its partners needs to be re-oriented towards high-value paid courses. Banks of high-quality courses in new and strategic areas that are associated with robust jobs, such as Industry 4.0 and greening TVET, need to be created in both online and in-person delivery modes. Quality assessment frameworks need to be put in place to ensure that courses are maintained at a high standard of quality. The eSkillIndia portal of the NSDC and the FutureSkills Prime initiative of the National Association of Software and Service Companies (NASSCOM) are steps in the right direction.

Recommendation 4
Ensure inclusive access to TVET for women, persons with disabilities, and other disadvantaged learners.

Women and youth in rural areas, who are unemployed, self-employed, or working for very depressed wages due to lack of training, need to be trained to enable them to earn a better livelihood near their homes. They must also be assisted with certification of their skills through the RPL mechanism. The facilities that will be set up at school complexes must be used for the benefit of the local communities, by providing vocational training for out-of-school youth and adults – especially women – after school hours. Other existing training facilities may also be considered for similar use.

Persons with disabilities (PwDs) have additional difficulties finding livelihood opportunities. Some of the excellent initiatives taken up by the NSDC to support them need to be scaled up so as to reach every such person. Children with disabilities (CwDs) must also be provided with training that matches their aptitudes and special abilities. Since both PwDs and CwDs can benefit greatly from opportunities for online training, all existing online courses need to be adapted for their use. Future digital course material must be required to comply with standards that ensure they are usable by this group.

Most of the training that workers in the informal sector receive are through unpaid or paid apprenticeships, mentorships, and other forms of work based learning (WBL) such as shadowing and team based learning. Yet the National Apprenticeship Promotion Scheme (NAPS) does not extend to this sector. A major push towards designing appropriate WBL schemes that benefit disadvantaged learners in the informal sector is urgently needed.

Recommendation 5

Massively expand the digitalization of vocational education and training.

The FutureSkills Prime initiative of NASSCOM is a welcome model of digitalization in which industry, academia, and government have come together for the first time to provide high quality TVET in strategic areas of Industry 4.0. Similar digitalization models need to be devised for sharing courses among educational institutions, as well as between individual educational institutions and private providers. Teacher competencies represent systemic challenges to the adoption of digital TVET. Teachers and trainers need to be provided access to a range of high-quality courses online, both for their induction training as well as continuous professional development. Content repositories with banks of high-quality training content, including simulations, games and so on, too need to be created to supplement and reinforce the practical training component of TVET.

The pandemic-induced lockdown in countries across the world, and the consequent move towards online education and work-from-home has underlined the importance of digital TVET. The lockdown has also brought into focus the sharp digital divide in India with regard to access to both the Internet and devices suitable for learning and producing content. This needs to be addressed through the provision of data/wi-fi access to all educational institutions, especially those in rural areas; the provision of laptops with Internet access to all teachers and trainers as recommended by the NEP; a one-time provision of tablets/smartphones at subsidized rates to students; and suitable arrangements for teacher-training in all aspects of online education, including pedagogies and the creation and use of digital content.

Below: Trainees undergo the ICT course in a computer lab at Learnet Skills. Digitalization in TVET has been accelerated by COVID-19, involving not only remote teaching and learning but also remote assessments, hiring and use of digital credentials. Okhla, New Delhi, India.

Recommendation 6

Support local communities in generating livelihoods by capitalizing on India's cultural heritage.

India's vast reserves of tangible and intangible cultural heritage include several UNESCO World Heritage sites and a very wide variety of art and craft. Their preservation and promotion can support many more jobs than they do at present and requires a mission-mode, multi-pronged approach to the preparation of an adequately trained workforce. The possibility of creating a new Sector Skill Council for Culture that can design TVET courses for this special sector is an excellent idea that needs to be brought to fruition. Each aspect of the tangible heritage sites – from their history, the art and craft of preserving relics, protecting them from erosion and miscreants, to their presentation before the visiting public – require different types of trained personnel and appropriate courses need to be designed to train them. Innovative financial models need to be worked out that can help run these tangible heritage sites sustainably from the revenue generated through tourism.

Most of the art and craft that form India's intangible cultural heritage are created in family-owned enterprises, in a few million micro and nano enterprises concentrated in a few thousand artisanal clusters within the country. The artisans learn their basic skills through informal apprenticeships and other forms of WBL, but can benefit greatly from training in aspects of business such as finance, sourcing of quality raw materials, design, market promotions, e-commerce, technology upgradation and more. Such training can enable them to reach larger markets and generate higher incomes in a sustainable manner. The ODOP programme by the UP government is a step in the right direction. The Jan Shikshan Sansthans that are also engaged in preserving the intangible culture of their localities need to be included in such efforts.

Recommendation 7

Align better with the 2030 Agenda for Sustainable Development.

The 2030 Agenda for Sustainable Development provides a comprehensive framework for the creation of new and relevant TVET programmes in many areas of strategic importance to India such as water management and sanitation, clean energy, climate change and sustainability etc. Educational institutions in the country must be encouraged to adopt a holistic approach towards sustainable development through greening TVET via the curriculum and courses that are made available to students, the engagement of all stakeholders in the long-term planning and implementation of sustainability initiatives backed by monitoring and evaluation, the realization of green campuses, engagement in greening research, and nurturing a culture of greening all round. A focus on achieving the targets associated with the SDGs needs to be a key feature of TVET provision going forward.

Education for Sustainable Development promoted by UNESCO seeks to nurture a sense of local and global responsibility, future-oriented anticipatory thinking and a recognition of global interdependence, and emphasizes cultural changes that embrace the values of sustainable development. The NEP 2020 places schools and colleges at the forefront of such efforts, supported by the new national curricular frameworks that will be developed for school and higher education. TVET that is aligned to these goals can equip learners with the knowledge, skills and competencies they need to effect the necessary change and perform their roles to the point that sustainability is embedded in everything they do.

Top: Women honing their stitching and tailoring skills at a garment construction course under AIF's Market Aligned Skills (MAST) programme. Rewari, Haryana, India.

Recommendation 8
Deploy innovative models of financing TVET.

Development impact bonds (DIBs) are a novel way of financing in which funding is tied to outcomes. NSDC is launching the Skill India Impact Bond (SIB) which will be focused on translating skilling into large-scale paid employment, especially for women. The SIB will be launched in partnership with the British Asian Trust with a value of approximately US$15 million. The overarching objective of institutionalizing an outcomes focus is extremely valuable in the Indian context and needs to be adopted widely.

An intervention by the American India Foundation (AIF) that provides rickshaw pullers financial assistance to own their rickshaws is another innovative financial model. It engages NGOs and micro finance institutions as intermediaries to organize rickshaw owners into joint liability groups, receive loans from the banks and disburse it to the rickshaw owners and also collect payments. The possibility of deploying such well-thought-out models for other groups of informal workers so that they too can get bank accounts, own assets and be able to access insurance and pension services like the rickshaw owners needs to be explored more widely. The Kerala model of creating shared infrastructure for TVET provision through community skill parks is a third innovative financing model, and more will be needed.

Recommendation 9
Expand evidence-based research for better planning and monitoring.

There is little or no capacity for TVET research in India today. Efforts need to be made to develop research capacity by drawing on international models such as the one in Germany that is based on study programmes for the education of TVET teachers in thirteen different vocational disciplines. The education of TVET teachers/trainers in India is not yet organized at the level of master's degree programmes in these standard vocational disciplines. The fact that most teachers/trainers in vocational subjects do not have tenure is also a major deterrent for the advancement of research.

High-quality research based on careful data-gathering and analytics can add value to all aspects of TVET planning and delivery, including tracking student life cycles across skilling, upskilling and reskilling, and aiding policy formulation based on assessment of outcomes. As the number of universities and colleges that are engaged in the provision of TVET grow, a vibrant research community needs to be created. Aggregate data of skilling, suitably anonymized, needs to be made available to researchers for data analytics. Research into this data can provide valuable inputs into future policy making, or for adjusting policy implementation as needed.

There are several questions – having an immediate bearing on the integration of vocational education into schools and colleges – that need to be researched. They include:

- The erosion of different types of work and how TVET systems must respond.
- The quality of education and the didactic approaches that need to be established.
- How teachers and trainers should be educated and trained.
- The permeability between general and vocational education.
- The relative merits in the Indian context of the dual model of apprenticeship training compared to a school-based TVET system and many more.

Recommendation 10

Establish a robust coordinating mechanism for inter-ministerial cooperation.

A National Council for Integration of Vocational Education (NCIVE), recommended by the NEP, consisting of experts in vocational education and representatives from across ministries and other stakeholder groups, needs to be set up at the earliest. This will help address the lack of know-how among stakeholders and speed up the uptake of vocational education by identifying successful models and best practices and disseminating them among educational institutions. NCIVE can also track the integration of vocational education on ground, and gather feedback towards agile and data-driven decision making. It can also take up many other tasks related to coordination across ministries and help to create, hold, and make use of the valuable institutional memory that will be generated through the entire integration effort.

The NSDC and the PSSCIVE are two other institutions that have been contributing extensively towards inter-ministerial coordination. Going forward, the roles of both these institutions must be grown and strengthened considerably towards addressing challenges in integration of vocational education.

State governments may consider setting up a State Education Commission, as recommended in the Draft National Education Policy 2019, comprising representatives from all stakeholder groups including government departments and eminent educationists from civil society. The commission would track the progress of integration, and interact with students, parents and teachers to ensure that the intended outcomes are achieved.

Right: A trainee learns welding basics using a welding simulator at Learnet Skills. New Delhi, India.

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Top: An automobile technology technician ensures proper working of an engine. WorldSkills 2019, Russia.

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Below: Ramjan Momin (West Bengal) formerly a daily wage worker, represents India in brick laying. WorldSkills Competition 2019, Russia.

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Top: An Indian participant inspects water samples and filter systems. WorldSkills Competition 2019, Russia.

Back cover: Aswatha Narayana, India's first gold medallist at WorldSkills, completes his daily water technology module. WorldSkills Competition 2019, Russia.

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Quality TVET for all

contributing to sustainable development, globally

United Nations Educational, Scientific and Cultural Organization

UNEVOC International Centre for Technical and Vocational Education and Training

The shift towards virtual learning, training and capacity building has made knowledge exchange possible on an even greater scale and fostered the development of joint strategies to address collective challenges.

The UNESCO-UNEVOC Medium-Term Strategy for the period 2021–2023 (MTS-III) adopts a more inclusive, gender-equal and hands-on approach to supporting TVET actions on the ground. It is guided by four principles: partnership, optimizing, prioritizing and adapting.

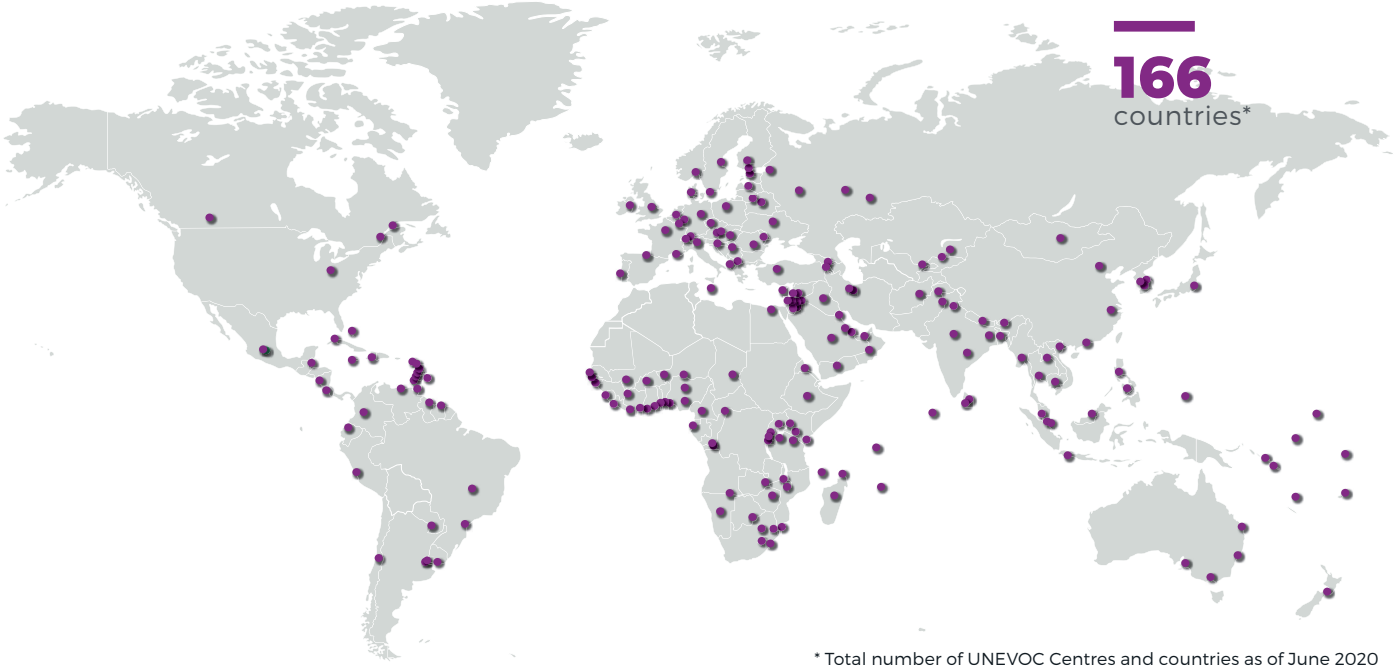
Working alongside its partners, UNEVOC Centres and TVET stakeholders, UNESCO-UNEVOC will seek to advance future-oriented TVET that is more responsive to sustainable development and labour market demands.

THE UNEVOC NETWORK

UNEVOC's Global Network of TVET Institutions

254
UNEVOC Centres

166
countries*



* Total number of UNEVOC Centres and countries as of June 2020

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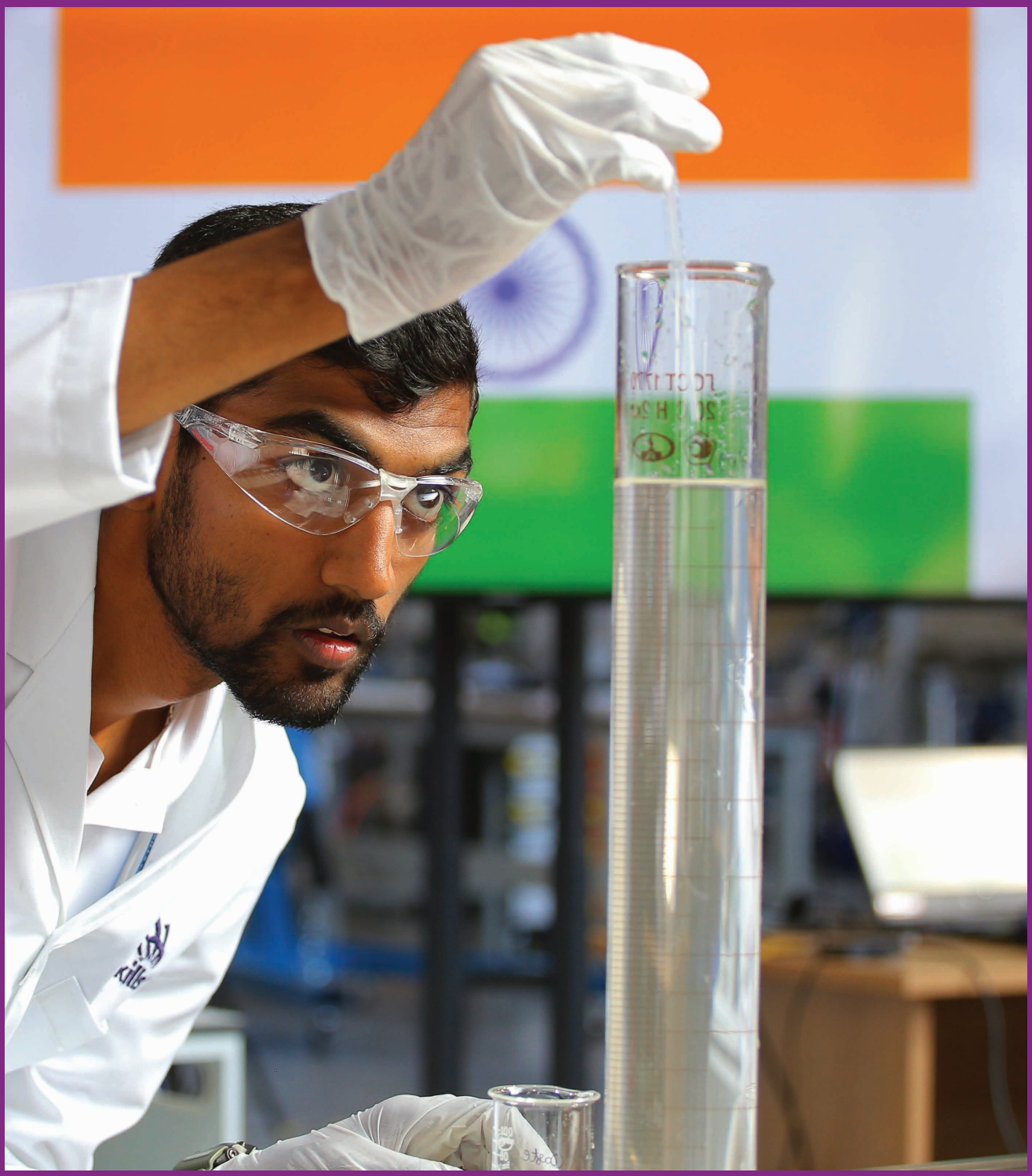

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Nepal and Sri Lanka

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