Vocational Education and Training Reform in India

Business Needs in India and Lessons to be Learned from Germany

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Working paper

BertelsmannStiftung

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This report was prepared by a team led by Dr. Santosh Mehrotra, Director General, Institute of Applied Manpower Research (IAMR). The team members were Dr. Ravi Raman, Kalaiyarasan, Neha Kumra (IAMR) and Daniela Röß from Bertelsmann Stiftung. Dr. P. K. Saxena, Dr. Kamala Devi, S. K. Yadav and Vijay K. Saxena assisted them in the primary survey.
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List of Abbreviations

ACMA	Automotive Component Manufacturers Association of India
AICTE	All India Council for Technical Education
AITT	All India Trade Test
ATS	Apprenticeship Training Scheme
BBiG	Vocational Education and Training Act
BiBB	Federal Institute for Vocational Education and Training
BVC	Bosch Vocational Centre
CBS	Continental Business Systems
CII	Confederation of Indian Industry
CTS	Craftsman Training Scheme
FICCI	Federation of Indian Chambers of Commerce and Industry
GIZ	Gesellschaft für Internationale Zusammenarbeit
GTZ	German Technical Cooperation
ITC	Industrial Training Center
MHRD	Ministry of Human Resources Development
MKI-DS	Mubarak Kohl Initiative-Dual System
MOLE	Ministry of Labor and Employment
MSME	Micro, Small and Medium Enterprises
NCERT	National Council for Education Research and Training
NCVT	National Council for Vocational Training
NOS	National Occupational Standards
NSDA	National Skill Development Agency
NSDC	National Skill Development Corporation
NSF	National Skills Fund
NSQF	National Skills Qualification Framework
NTF	National Training Fund
NTTF	Nettur Technical Training Foundation
OS	Occupational Standards
PPP	Public Private Partnership
SDIS	Skill Development Initiative Scheme
SSC	Sector Skill Council
SSLC	Secondary School Level Certificate
TVET	Technical and Vocational Education and Training
VET	Vocational Education and Training
VTP	Vocational Training Provider

Preface

India is among the countries with the lowest proportion of trained youth in the world. Even worse, vocational education in secondary schools has received very limited funding since the mid-1980s; it has remained non-aspirational, of poor quality and involves little industry collaboration. The Vocational Education and Training (VET) system in Germany, in contrast, shows a much higher proportion of youth participation, more intense involvement of the private sector and is anchored in the law.

In this context, this study will take a closer look at the experience of Germany's Dual System of education and training, which has been historically cited as a successful model that has contributed to the success of Germany's manufacturing sector in global competition. Most of the 43 organised-sector companies that responded to the primary survey for this study were large manufacturing businesses. The survey attempted to identify the skills gaps experienced by German, Indian and joint-venture firms in India. The study asserts the need to restructure the Indian Technical Vocational Education and Training (TVET) system to address current and future challenges by engaging the corporate sector, the state and students/parents as major social partners.

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Executive Summary

This study on the issue of reforms to Indian Vocational Education and Training (VET) has been undertaken at a time at which the country is facing both opportunities and challenges in India's growth story. Opportunities in terms of a demographic dividend are faced by the challenges of persistent skills gaps: barely two per cent of the Indian workforce have formally acquired skills. Only 2.4 per cent of the workers have technical education of any kind. The Indian government has set a target to skill 500 million people by 2022. A different estimate suggests that a number of 291 million skilled workers is needed by 2022 if India wants to become a globally leading manufacturing economy (Mehrotra et al 2013).

Drastic restructuring of Indian VET has been suggested as one of the key routes to overcome persisting skills gaps and pursue inclusive growth in the midst of demographic and structural economic transformation. The study deals with this question by suggesting a reform agenda through the adoption of certain critical elements of the historically successful German dual system, i.e. the combination of practical and theoretical vocational training. However, the requirements on the Indian labor market and the skills needed there raise concerns that go beyond the German experience.

The three major objectives of the study thus are: 1) to understand the skills-related issues of Indian and German companies operating in four sectors (chemicals, automotive, electrical and electronics, and IT) in India; 2) to examine the possibility of transferring some elements of the German dual system to the Indian context; and 3) to develop workable recommendations regarding the areas in which the Indian system of skills development could be improved.

Findings from the primary survey

The findings from the primary survey support views that have often been raised in public discussions in recent years.

a) A large number of the companies interviewed revealed that they were facing some sort of skills-related problems, both in terms of quantity and quality of skills. This holds true for large companies as well as for small and medium-sized enterprises.

b) The nature of training and availability of infrastructure for training within companies varies according to company size. Larger companies have fully equipped training centers, while smaller ones provide functional and work-oriented training to newcomers, based on their immediate skills needs.

c) The most frequently cited deficiency of the current system of Vocational Education and Training (VET) was the separation between theory and practice that needs to be resolved. The lack of qualified trainers was addressed as a second big problem.

d) Companies resort to technological changes to close the skills gaps replacing labor with new machines.

e) Companies have expressed an interest in cooperating on skills development and basic training. In particular small companies appeared interested in cluster-based training. Some of the companies expressed reservations regarding joint funding models, since they are unwilling to share their proprietary knowledge.

f) Some companies expressed a desire for the government to guarantee a return on companies' investment in training by changing regulations or providing incentives to those that do provide training.

g) Several enterprises suggested that changes to the Apprenticeship Act which regulates the training of apprentices in the industry are required in order to render the remuneration and duration of training more flexible. It is often argued that the Apprenticeship Act is largely aimed at addressing the legal requirements and obligations set down by it, and not at the actual improvement of skills.

h) In addition to this, there are problems such as a lack of awareness for apprenticeship schemes, outdated curricula and cost of training.

Lessons of the German dual system and recommendations for India

The lessons that can be learned from the German model could help to overcome India's challenges. Three elements of the German model are of particular interest for the Indian context.

a) Germany's success can largely be explained by the fact that the dual principle has been systematically institutionalised in the country's Vocational Education System. The dual principle must become the basis of reforms of the Indian VET system, especially in secondary schools. This requires the integration of state-of-the-art theory in vocational schools as well as practical training in companies. Learning venues in India should include both classrooms and worksites/factories.

b) Germany applies an integrated approach to VET. Here, various stakeholders (private companies, the government, trade unions, employers' associations, etc.) are actively involved as social partners in designing curricula, codifying skills and stipulating standards. This approach of public private partnerships (PPP) is desirable for India, where the private sector hardly contributes to curriculum development at all yet and certification is governed solely by the Ministry of Human Resource Development at this time. Industries and their associations should be encouraged to help update teaching materials, practical training and occupational standards in accordance with the skills they need. A new governance structure could be introduced by passing a comprehensive Vocational Education and Training Act – roughly similar to the

Vocational Education Act (Berufsbildungsgesetz, BBiG) in Germany – which would make the VET system more adaptive to the requirements of the economy. A joint exercise among the stakeholders of the VET system could be part of building up the long term institutional and legal framework of the Government of India.

c) While more than 80 per cent of training costs are covered by the private sector in Germany, the corresponding percentage is extremely low in India. In order to remedy this situation, we recommend that public-private participation in sharing the cost of training be adopted in India. One way to solve this issue is to establish a National Training Fund in India through which private actors can contribute.

Recommendations beyond these elements of the German model of vocational education

Drawing on our survey and current discussions in India, there are other important steps beyond the three elements of the German system mentioned above that should be undertaken to reform VET.

a) Qualified trainers who are able to teach the theoretical and practical skills relevant for the industry in India are a necessary precondition for a qualified workforce. This has also been suggested by the companies which have been interviewed in the context of the study.

b) Small companies can develop cluster-based training approaches to counter the lack of training capacities; industry associations are required to support such approaches by offering funds with the help of state initiatives.

c) The adoption of Industrial Training Institutes/Industrial Training Centers by employers' organisations or private companies could be one way to enhance public-private cooperation.

d) Industry should be required to invest in education and training as part of its corporate social responsibility.

Chapter 1

Introduction

Human resource paradox

India's demographic development offers both opportunities and challenges. India is set to become one of the youngest nations in the world by 2020. It is strengthened by the fact that the average working Indian will be only 29 years by 2020 as compared to 37 in China and the US, 45 in Europe and 48 in Japan (Economic Survey 2011–12, Government of India). This will clearly give India an edge over the rest of the world with respect to its key human resources. However, the challenges, if not addressed, may render such demographic dividends useless. The larger structural transformation of the Indian economy has caused rural workers to leave their traditional agricultural occupations: thirty-seven million workers left the agriculture sector between 2004–05 and 2011–12 (Mehrotra et al. forthcoming) to join the construction, manufacturing and service sectors. These workers have largely ended up in the informal sector, working in low-paid jobs, largely due to lack of any form of vocational training. Another challenge that the country currently faces is what we call the human resource paradox: high youth unemployment in combination with a low skill availability of the workforce. Currently, it is as low as five per cent if vocational education and other forms of technical education are taken together, as compared to more than 60 per cent in many other countries (see Planning Commission 2008; FICCI 2012). The challenge is further strengthened by the fact that the lack of industry-specific skills is the most severe in employment creating sectors such as manufacturing, software and automobiles.

Persisting skills gaps

Persisting skills gaps on the Indian labor market have been a serious concern for both policy makers and industrialists in India. Various studies have highlighted skills gaps in different sectors in India (Mehrotra 2012; Chenoy 2012; Jamal and Mandal 2013). At an aggregate level, just over two per cent of the Indian workforce have skills training in formal vocational education. Only another 2.4 per cent have received informal vocational training (Mehrotra 2012). The graduates who have received vocational education also lack the skills required in the labor market. Thus, the employability of graduates continues to be a major concern and there is no formal link between general education and vocational training in the country. In addition, the labor market in India is undergoing dynamic change. According to the National Policy on Skills Development 2009, it is expected that 365 million people will be eligible to join the workforce over the next 15 years. About 11–13 million people are expected to look for employment opportunities each year. Sensing this urgency, the 12th five-year plan cites skill development in different sectors as an important task (Mehrotra et al, forthcoming). Persisting skills gaps also have qualitative dimensions, an aspect often not highlighted in public discussions. Studies on the quality of skills and the mismatch in demand and supply (FICCI 2006, World Bank, 2007, ILO, 2003, IAMR, 2010) have brought to fore issues such as lack of marketable skills and low standards of quality. The reasons cited include obsolete courses, failure to upgrade modules, failure to respond to market signals and the consequent lack of functional skills (IAMR, 2011).

Lessons from Germany?

In this context, the study seeks to understand the experience of Germany's dual system that has been historically cited as a successful model of education and training (Euler 2013) and a reason for low youth unemployment. Second, it wants to identify practical solutions for the issue of skills gaps in India by reforming the Indian technical and vocational education system (TVET). The study asserts the need to restructure and reorient the Indian TVET to address the current and prospective challenges by involving the corporate sector, the state and students/parents as the major social partners. It is argued that VET in India could be strengthened by adopting some of the critical elements of Germany's dual system, which in turn would fortify the Indian economy. The study will explain the differences between the German and Indian systems, the key factors in Germany and how these could be adopted to make a blueprint for practical application.

Objectives of the study

Three steps of the study

First, the study seeks to understand the skills-related employment issues of Indian and German companies operating in four sectors (chemicals, automotive, electrical and electronics, and IT) in India based on a survey.

Second, it looks at the experience of the German dual system as it has historically been cited as a successful model of vocational education and training. It specifically looks at the eleven elements of the German dual system identified in a study by the Bertelsmann Stiftung "Germany's dual vocational training system: a model for other countries" (2013), written by Professor Euler, and identifies those elements that could be interesting in the Indian context. Three elements will be discussed in detail and recommendations will be provided on how an effective Indian model could be developed and advanced in terms of skill enhancement, joint funding, curriculum design and work-effectiveness.

Third, it offers recommendations for improvement of the Indian VET system with the objective of minimising skills gaps in India.

Methodology of the primary survey: sectorial approach

Four sectors and four city clusters

The methodology adopted in the primary survey is a sectorial approach with a focus on four sectors spread across four city clusters and three states of economic (especially manufacturing) activity in India: Chennai, Bangalore, Pune, and Mumbai (Tamil Nadu, Karnataka, and Maharashtra). This enables us to study the differential nature of the requirements of different sectors with recognition of two aspects as a common element:

(1) there is a shortage of required skills in the respective sectors and

(2) the companies still manage to run their business activities with their own way of making trained workers available. Larger companies usually do this by way of in-house training, while small and medium-sized enterprises try to find alternative training options.

Company sample

Forty-three (43) companies were surveyed, of which twelve were German companies, seven were joint ventures, 20 were Indian companies and the rest (4) were joint ventures with companies from other countries. Thirty-two (32) of the companies in our sample employed more than 100 workers (and hence were relatively large); the rest employ fewer than 100 workers (and are called 'small' when we report our survey findings). In terms of sectors, 38 companies were in manufacturing, while five of them were in services. We used a random-sampling technique from a comprehensive list of companies in each sector made available to us by the Indo-German Chamber of Commerce, New Delhi and Bertelsmann Stiftung, Germany. We selected them based on the sectorial composition of companies and adequate representation by state. We included an additional sample of Indian companies in order to compare and contrast Indian and German companies. Asking specific questions, we sought to ascertain company satisfaction with the availability of skills, the in-house training provided, companies' expectations of the state with regards to meeting skills gaps and the mechanism for potential collaboration.

Given the relatively small sample, one cannot make any broad generalisations. Still, the findings provide valuable indications about the current situation and potential reform paths.

Outline of the survey research questions

Research questions

The first part of this study addresses the following research questions:

- What are the current requirements and availability of different skills in the main business sectors in which German companies are concentrated, such as the automotive and chemicals industries, to what extent are they met through in-house training, what are their expectations regarding state provision of training and how well would they be able to co-operate in the program?

- What exactly are the obstacles faced by German and Indian companies in India in terms of supply of skills required and company-skill compatibility?

- What institutional mechanisms and arrangements could be developed as part of reforming the Indian VET by enhancing cooperation between the government and business sector in the area of skills development?

- What specific recommendations could be generated to improve VET in India which would integrate some of the critical elements of the dual system, such as public-private partnership and in-house training? What role could each of the stakeholders involved play?

Organisation of the report

The report is divided into five chapters. Following the introduction, chapter 2 discusses the demand for skills among Indian and German companies operating in India. This is done with a focus on four major sectors selected for study, namely chemicals, automotive, electrical and electronics, and IT. We have also touched upon the gaps between the demand of the companies on the one hand and the "supply" of the current VET system in India on the other hand to identify what changes are necessary in the Indian VET system. This is largely based on our field survey. Chapter 3 analyses the VET system in Germany, followed by Euler's approach of dividing the dual system into eleven elements. Closely related issues such as the dual principle, public-private partnerships and joint funding are elaborated. Chapter 4 discusses the strengths and weaknesses of VET in India, highlighting the need to reform the system. It also deals with the elements of the dual system which could be integrated into the Indian system with a focus on Euler's approach and going beyond it as it takes into account the 'best practices' at home and abroad. In Chapter 5, we recommend specific reforms for improvement of the Indian VET system to meet the skills requirements of these industries in the short and long run with the broader objective of higher performance of the economy as a whole.

Chapter 2

Skills Demand in India for German and Indian Companies

Trends in India

Skills training is increasingly required in two areas: making new job seekers entering the labour force employable and reskilling those who shift jobs. This is necessitated by two underlying trends in India: the demographic dividend and structural transformation, trends which we have briefly touched upon in Chapter 1. We will cover the same question in this chapter, but focusing on linking up the skills demands of German and Indian companies operating in India. This is based on our field survey of four sectors: automotive, chemicals, manufacturing and software/IT in the city clusters of Chennai, Bangalore, Pune and Mumbai.

Structure of the survey

Section 1 introduces the skills gaps in the present context and the skills gaps we expect ten years from now. Section 2 discusses the reasons for the urgency of skills training as explained in terms of demographic and structural transformation of the economy. In Section 3, we present the survey coverage of the companies studied in terms of ownership (joint ventures, German, Indian, etc.) and sectorial composition. This is followed by the survey results in terms of theory and practice with reference to those who qualify through the Vocational Education and Training (VET) programme as experienced by industry (Section 4). In Section 5, the ways in which the companies address the skills gaps and the nature of alternative arrangements, such as in-house training, that they resort to are addressed. In Section 6, the option for small companies of organising cluster-based training is discussed. Finally, we explore the willingness of companies to cooperate with joint funding.

2.1 Skills Gaps: Present and Future 2022

Level of education

It must be pointed out that a large proportion of the workforce in India is either entirely illiterate or has only primary/less than primary education. In 2009/10, only 50.8 million of the total workforce of 460.2 million had a secondary education, 7.9 million had formal vocational training and 10.5 million had technical education[1]. As seen in Table 1, 228.2 million members of the workforce were either entirely illiterate or had primary/less than primary education (Mehrotra et al 2013).

1 Technical education is imparted only to those with at least higher secondary schooling. Vocational education/training requires a minimum of 8 years of schooling, and often 10 years.

Table 1: Education and training of the workforce, 2009/10

	Workforce in age group 15–59 (420.6 million)	
	Current number (in millions)	Share in per cent (approximation)
Not literate	125	29.72
Below primary, primary and literate without formal schooling (up to 5th grade)	103.2	24.53
Middle (6th to 8th grade)	74.1	17.61
Secondary (9th to 10th grade)	50.8	12.07
Higher secondary and above (diploma/certificate/ graduate/postgraduate) (11th grade and above)	67.5	16.04
Total	**420.6**	**100**
Distribution of work force having vocational training and technical education		
Formal vocational training	7.9	1.9
Technical education	10.5	2.4

Source: Mehrotra et al, 2013

12th five-year plan

It is argued that the challenge for skills development in the 12th five-year plan is two-fold (Mehrotra, forthcoming). The first target is giving the half of the current work force (about 228 million) which is either illiterate or has only completed primary education or less (likely to be functionally illiterate except for the ability to write their name) functional literacy and numeracy. Therefore, the government has to ensure that all children between the ages of 6 and 14 are completing elementary education by the end of the 12th five-year plan, as required by the Right to Education Act, 2009. Eight years of schooling is an essential pre-requisite for any teenager to achieve admission to vocational training.

Estimation of skill demand

Second, a recent estimate of the number of people to be skilled by Mehrotra et al (2013) reveals that two million workers are expected to join the workforce in India each year. The labour force projected for 2022 would be around 580 million. Nearly 291 million of these – or about half of the workforce – will need to be skilled by 2022.

Table 2: Numbers to be skilled by education level in 2022 (millions)

Formal vocational training	136
Vocational training for those informally trained	55
General education higher secondary & beyond	100
Total	**291**

Source: Mehrotra et al, 2013

2.2 Demographic and Structural Transformation in India

Growth is slowing

Since the current growth rate of the population is at 1.6 per cent per annum and the total fertility rate is dropping towards the replacement rate of 2.6 (IAMR 2011), the workforce to be skilled will likely continue to increase, though at a slower rate. The new entrants into the labour force and those who shift jobs would comprise heterogeneous skills levels, both in terms of scale and quality. They all would require varying degrees of skilling and reskilling.

The necessity of targeted skilling has yet another dimension, brought on by the structural transformation of the economy. As has been highlighted by Mehrotra et al (2013), there has been an outflow of labour from the agricultural sector mostly towards services and manufacturing in urban areas. Nearly 37 million workers have already left traditional agricultural work between 2004/05 and 2011/12.

High-growth and job-creating sectors

Training the unskilled and semi-skilled and making them employable would be the first major task of any government. The 12th five-year plan thus faces challenging tasks: the government has identified 20 high-growth sectors of industries and services that have the ability to provide expanded employment, including ten high-growth job-creating sectors (manufacturing, textiles, construction, automotive, health care, i.a.).

2.3 Survey Results

Company sample

It must be noted here that our survey is a slice of the organised-sector companies. Organised-sector contribution to total employment in manufacturing is at just about 15 per cent, while its contribution to total output is at about 78 per cent (Mehrotra et al 2012). This must be taken into account before prescribing any policy recommendations based on the field survey. As shown in the tables below, 43 companies were surveyed, among them twelve German companies, seven joint ventures, 20 Indian companies and four joint ventures with other countries. In terms of sectors, 38 companies were in manufacturing, while five of them were in services (see Table 3 below). Similarly, among the 38 total manufacturing companies surveyed, the automotive and related companies accounted for the largest share in the sample at 22 companies (see Table 4 below). Nine companies were from electrical and electronics, and another five companies were from the chemical sector. If we look at the distribution of companies in terms of nature of products (capital goods, intermediate goods and consumer durables etc.), we find that most of the companies (35) are in the intermediate sector, following an equal distribution of companies in capital goods and consumer durables. Many of the companies belonging to the intermediate sector are suppliers of electronics, brake systems, chemicals, ICT and machine tools. Case studies among the companies with state-of-the-art in-house training are analysed in the hope that other companies could emulate such practices.

Table 3: Distribution of companies according to ownership

		German	Indian	Joint Venture	Others	Total
Large	Manufacturing	8	12	4	4	28
	Services	2	2	0	0	4
Small and Medium	Manufacturing	2	5	3	0	10
	Services	0	1	0	0	1
Total		**12**	**20**	**7**	**4**	**43**

Source: Computed from the field survey

Table 4: Distribution of companies by sector

	Electricals & Electronics	Chemicals	Auto and Auto Components	IT	Others	Total
Maharashtra	3	2	16	1	1	23
Tamil Nadu	3	2	5	0	0	10
Karnataka	2	1	1	4	1	9
National Capital Region[2]	1	0	0	0	0	1
Total	**9**	**5**	**22**	**5**	**2**	**43**

Source: Computed from the field survey

Nature of skills gaps

This field study reaffirms the skills gap in India and goes further in identifying the nature of skills gaps in the sectors that we selected for our study. Almost all the companies that we had interviewed revealed that they were facing some sort of skills-related problems (36 companies out of 43). The skills-related problems are twofold: quantity and quality. The companies that are smaller in size are facing shortages in the quantity of skilled personnel. Small companies generally face competition for low-end skills such as those of fitters and electricians. Large companies, meanwhile, face the problem of quality of skills which they attribute to the weaknesses of the Indian educational system, including that of VET. The problem named most often is the insufficient link between theory and practice (see Figure 1 below).

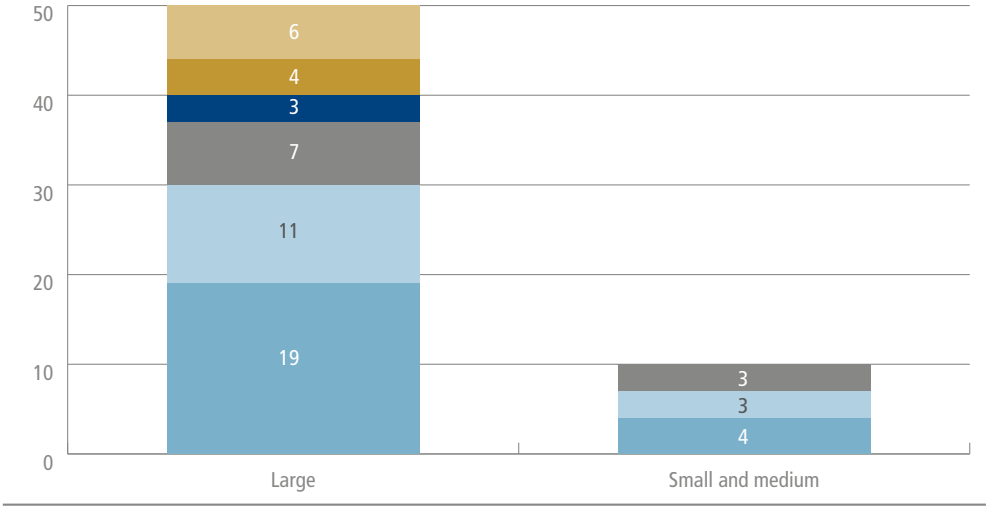
Table 5: Deficiencies in skills development as cited by large and small companies

	Large	Small and medium
Link between theory and practice	19	4
Curriculum	11	3
Industry exposure	7	3
Teaching quality	3	0
Motivation	4	0
Communication	6	0

Source: Computed from the field survey

2 The National Capital Region (NCR) in India is the designation for the conurbation or metropolitan area which encompasses the entire National Capital Territory of Delhi, including New Delhi, as well as urban areas surrounding it in the adjacent states of Haryana, Uttar Pradesh and Rajasthan.

Figure 1: Deficiencies in skill development as cited by large and small companies



Source: Computed from the field survey

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2.4 Skills Gaps: Theory and Practice

Lack of knowledge

Most companies in our survey complained that the students who graduate from Industrial Training Institutes (ITIs) and Polytechnics lack application-oriented knowledge and problem-solving skills. Some cited a lack of industrial exposure of students. The companies were almost unanimous in affirming that they need to train the new recruits on the job to make them employable. This is a major shortcoming of the way in which VET is organised and governed in India. Therefore, both micro and macro studies show that not only the percentage of the workforce having formal vocational training and technical education is low, but the quality of those who are trained also cannot meet the demands in industrial skills. For instance, Suspa Pneumatics India Pvt Ltd, which specialises in manufacturing gas springs and hydraulic dampers, said that "students lack even basic technical knowledge and don't have curiosity and motivation to learn".

Deficiencies of VET

VET may attract a sufficient number of candidates, but as Nettur Technical Training Foundation (NTTF)[3] has rightly pointed out in its interview, "instead of increasing the intake of students, it is better to increase knowledge of students," which in turn requires intensive teaching and practical training, the latter taking place in labs and on worksites. In addition, as has been raised in the discussions organised by the Bertelsmann Stiftung in Bangalore, "the orientation towards application is missing" in Indian vocational education. Up-to-date theoretical training in schools has to be combined with

3 NTTF is an educational foundation established in 1963. It implements its program of Technical Training in more than 20 training centres located in various states across India. NTTF assists industries by establishing training centres in partnership with industry associates.

relevant practical training at the worksites or at adequate training institutions. As the Human Resource faculty of Continental Automotive Components Ltd stated, lecturers need to go through training and should be exposed to industry: "They should be working for industry compulsorily". The Wipro representative noted delivery issues in teaching. He expressed concern about how to evaluate students: "today I don't know how to calibrate a Tamil Nadu kid's grade with a West Bengal kid's grade", "our 12th grades and engineering grades are highly non-calibrated" with regard to content and the extent to which real-life experience is imparted. He also said "We don't promote enquiry-based teaching... we need to promote the culture of one question with many right answers".

The Bosch example

In this context, the case of the Bosch Vocational Centre (BVC) in Bangalore should be mentioned, which draws on the German dual model. Bosch has training centres in Pune, Jaipur, and the outskirts of Bangalore. The student employees are paid a stipend of Rs. 3,000–4,000 during apprenticeship and 30–40% of the students are from Scheduled Castes, Scheduled Tribes and other backward communities; most of the students are supporting families. Students at Bosch are trained for three years under the Apprenticeship Training Scheme after 10th grade. Students are selected on the basis of marks, written tests, and interviews. The curriculum at BVC is customised to Indian requirements. It is the culmination of systems expertise and infrastructure. Industry exposure within the ITI/Craftsman Training Scheme is limited, whereas students at BVC are engaged with the industry (see Box 1 below on the Bosch Vocational Centre). Furthermore, NTTF mentions that the "Bosch Vocational Centre can be treated as role model...people should realise the importance of dual system... we are ready to tie up with BVC, Siemens ...".

Box 1: Bosch Vocational Centre

Training activity at Bosch Ltd dates back to 1953. The need for skilled manpower was felt from the start of Bosch's operations as its product lines of spark plugs and fuel injection equipment are high-precision items. Prompted by the requirement for skilled manpower, the Tool Room Apprenticeship scheme was started in 1953, and the Bosch Vocational Centre (BVC) was established in 1960. The BVC was conceived and set up as a fully-fledged training centre to develop the base of skilled personnel required to produce high-quality products on sophisticated machines. Since then, the BVC has been the centre to cater to all training needs of the company. It is notable that the BVC was established before the enactment of the Apprentices Act. In fact, the committee responsible for the formulation of the Act visited Bosch Ltd and found that the BVC was a working model for them to study. Bosch's insights on the draft memorandum of the Act were sought.

Presently, there is a group of 24 dedicated faculty members guiding the trainees to achieve excellence. The training schemes include trade apprenticeship training, which takes 60 students at Secondary School Level Certificate (SSLC) level in two batches each year, and graduate apprenticeship training, which takes 30 engineering graduates in Mechanical, Electrical, Electronics, Mechatronics, Automobile, Industrial Engineering & Management

and Industrial Production & Engineering streams each year. In addition to this, the project trainee scheme at Bosch Ltd was started in 1995 as a social obligation to strengthen the industry-institute relationship. In its scope, final-year engineering students from various colleges are allowed to carry out their project activities to fulfil their academic requirements while gaining experience in an industrial working environment.

Source: Information Booklet, Bosch Vocational Centre, Bangalore

Most of the companies in our study expressed a desire to participate in the curriculum design of ITIs through an appropriate institutional mechanism developed by the government. They also believed that collaboration between the industry and government is possible and that employers' associations have a role to play. In addition to this, they expressed a need for lecturers at vocational schools to go through training and be exposed to industry. Moreover, enquiry-based teaching needs to be promoted. Subjects taught need to be industry-relevant.

2.5 Training Strategies: In-House Training

One way to overcome skill deficiencies is to provide some form of in-house training for new recruits and employees. The Human Resources departments of selected companies were asked whether they have had any form of in-house training centre. Even a single training room is considered in-house training.

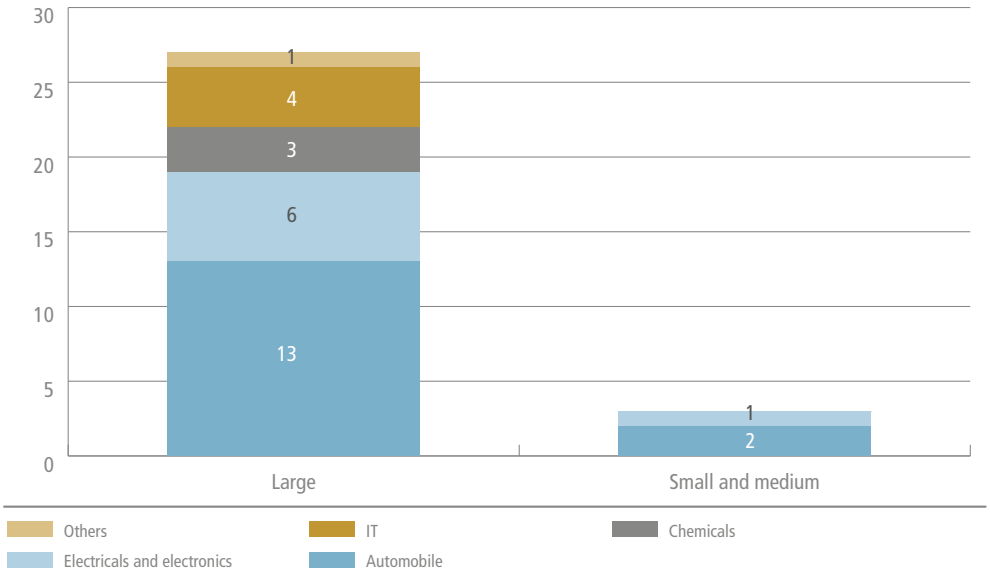
Small and large companies

The size of the companies was determined according to the number of employees on their payrolls; those employing less than 100 workers were designated as small, and those with over 100 employees were designated as large. For the small companies, the number of employees varies from nine to 100. For the large companies, it varies from 110 to as high as 100,000. Half of the companies employing between 110 and 1,000 workers are in the automotive and automotive components sector. Out of the 15 companies that provide employment in the range of 110 to 100,000, eight are in the automotive and automotive components sector. With respect to the IT sector, four of the five companies surveyed employ between 1,000 and 100,000 workers. It is clear from the survey that the large companies have to resort to some form of in-house training to remain productive and competitive. Small companies repeatedly said that they cannot afford to have their own training centres. Most of them are facing a shortage of skilled workers. Shortages of skills and skilled workers often result in higher wages than the competitive equilibrium wage.

Training facilities

Among the 30 companies reporting facilities for in-house training, 27 are large companies (employing more than 100 workers) and the rest (3) are small and medium-sized (see Figure 2 below). Out of 22 companies interviewed in the automotive sector, 15 had in-house training centres. Among the nine companies in the electrical and electronic sector, seven had some form of training facilities. The remaining eight that had training facilities were from the chemical and IT sectors.

Figure 2: In-house training by sector and employee numbers of companies



Note: Total companies offering in-house training was 30, of the 43 surveyed.

Source: Computed from the field survey

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Training varies according to the size of companies

Of the 22 companies interviewed in Bangalore and Chennai, eleven of them have training facilities on factory premises or elsewhere. However, the nature of training and availability of infrastructure varies according to the size of companies. Larger companies have fully equipped training centres, while smaller ones give functional and workable training to newcomers based on their immediate skills needs. Investments in training are made where companies are certain of a return from the training and confident that they will be able to retain trained workers. A comprehensive training programme that caters to potential employees, external candidates and faculty alike (as in the case of Infosys) is often indicative of efforts towards corporate social responsibility (see Box 2).

Box 2: Socially embedded strategy? Infosys Technologies Ltd., Bangalore

Caring for existing and potential employees – from training schools to corporate cabins – can be both a strategy and an act of social responsibility. In the context of training, it ensures a steady supply of skilled professionals. In terms of social responsibility, it boosts morale in the company while projecting a favourable public image. In this context, no other foundation programme in the world is as vast and well-integrated as that of the Infosys Global Education Centre (GEC). The residential training programme for entry-level engineering graduates at the GEC in Mysore has been imparting generic and stream-specific training in various technology domains to new recruits every year. GEC also offers

training in soft skills and leadership programmes that are taught by talented trainers. About half of the teachers are trainers with technical and non-technical expertise. The training programme starts with basics and includes comprehensive modules. The 23-week course begins with an internship followed by regular training in selected technologies to suit the particular requirements of organisations.

Over 100,000 entry-level engineers have been trained here so far. The facility can house 15,000 trainees at any one time. This is the brainchild of Infosys, one of the leading IT companies in India which currently employs 103,000 people in more than 50 offices across the globe. Infosysians, as they are called, are responsible for designing and delivering IT-enabled business solutions to the clients around the world. These solutions focus on providing strategic differentiation and operational superiority to clients.

Campus Connect

Knowing well that the IT industry as a whole needs to "scale up industry-ready high-quality students to meet the growing demands of the industry", Infosys launched Campus Connect in 2004, a first-of-its-kind industry-academia interaction programme. Campus Connect aims to be a partnership forum where the best practices at Infosys are shared with institutions. At this time, 60 engineering colleges all over India have taken part in the programme. More than 275,589 students and 9814 faculty members have benefited from this process of aligning engineering talents with industry requirements. Campus Connect also conducts Faculty Enablement Programmes to train the partner college faculty on Foundation Programme course delivery and industry-oriented courses. Both the GEC and Campus Connect are testimonies to Infosys' commitment to building the competency of their own employees and corporate social responsibility to the larger society.

In 2009, Infosys announced the expansion of its GEC in terms of infrastructure, training programmes and business activities. While trainees from India find GEC no less than a home, special programme participants from abroad find it a home away from home with state-of-the-art academic facilities (master class rooms, training rooms, libraries, conference halls) and holistic day to day life with fitness and recreation facilities, including football, cricket and tennis grounds spread over 337 acres.

Given the fact that Infosys is one of the global giants, it only attracts young professionals thus obviating the free rider problem. The company is also insulated from attrition, a common concern among other companies.

Source: Infosys Technologies Ltd, www.infosys.com

2.6 Small Company Options: Cluster Training

Skill needs of smaller companies

Smaller companies express interest in cluster training for skill needs in specific industries. They expect the government to play an active role in co-ordination or building of nodal agencies to impart training. Companies expect security of return on the investment they make in training. Some companies expressed a desire for the government to guarantee such return by changing regulations or providing incentives to those companies that provide training. They also articulate the need for changes to the Apprenticeship Act[4] to make it flexible in terms of setting pay and duration of training.

Willingness to cooperate

It was mentioned in our survey that companies are unable to influence each other's decisions to engage in inter-company collaborative projects, as it involves acceptance by the other company and high investments. Companies expect the government to co-ordinate them and to contain free-rider problems: other companies will hire already-trained workers and thereby free-ride upon investments made by one company in training or any of the state-run vocational schools. Companies also express concerns about inter-industry cooperation where proprietary technologies are concerned, since technology provides an edge in competition between companies. However, companies expressed a willingness to be part of such cooperation for some generalised basic training (see Figure 3 below).

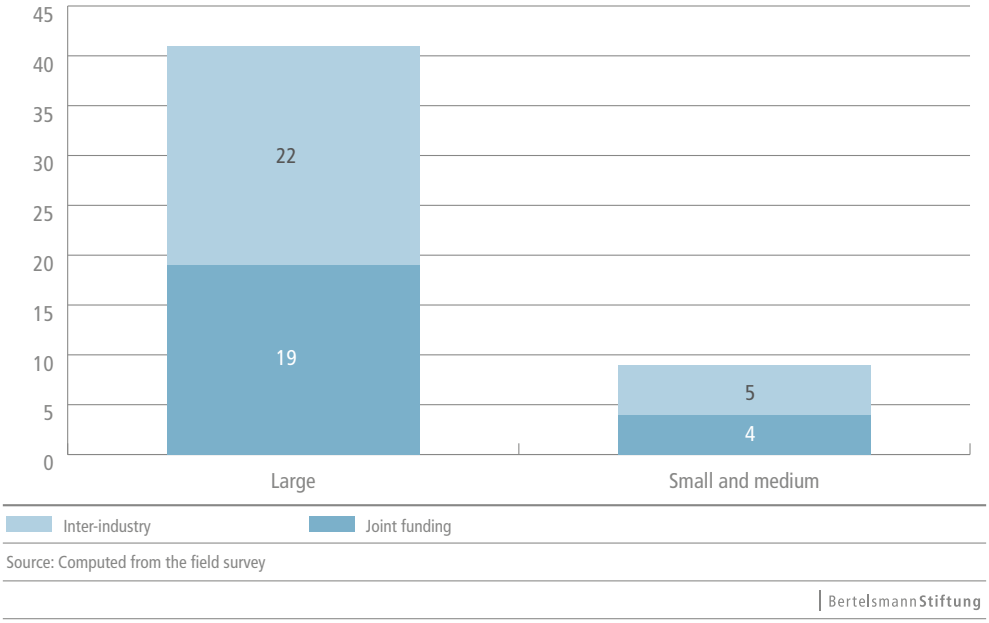
2.7 Joint Funding: Willingness to Collaborate

Joint funding schemes

Another significant finding is that companies are willing to cooperate with others in skills development programmes and joint funding with government. About 19 large companies reported their willingness to reserve funds for joint funding schemes for skills development while only three small companies expressed their interest in joint funding (see Figure 3 above). However, those companies that already have a training centre are not as interested in participating in joint funding. Some of them, like Wipro, have international training arrangements. Small companies are of the opinion that they cannot afford to invest in skills development. Similarly, about 22 companies have expressed an interest in working with other companies on skills development. Some of the companies expressed reservations regarding joint funding models as there is unwillingness to share their "proprietary knowledge". Only a few companies that already have training centres have no interest in further co-operation with other companies. While companies like Wipro, Continental Automotive Components Ltd., and Bosch have international collaboration for their training programmes (with Germany, the UK, etc.), small companies do not have the means for such facilities.

4 http://dget.nic.in/schemes/ats/Act1961.htm; http://dget.nic.in/schemes/ats/ATSOverview.htm. The Act was first amended in 1973 to include training of Graduate and Diploma Engineers as "Graduate" & "Technician" Apprentices; amended in 1986 to bring training in the 10+2 vocational stream as "Technician (Vocational)" Apprentices within its purview; amended in 1997 as regards definition of "establishment" and "worker", termination of apprenticeship contract, number of apprentices for a designated trade, practical and basic training of apprentices, obligation of employers, penalty for contravening the provisions of the Act and cognisance of offences. The Act was again amended in 2008 to modify various sections of the Act as regards reservation for candidates belonging to Other Backward Classes, cost of training and so on.

Figure 3: Large and small companies interested in inter-industry collaboration and joint funding with government



Source: Computed from the field survey

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Continental Automotive Components Ltd., a large company that states that training requirements are "client-specific", runs three sets of training – developmental trainings on automotive components, a leadership programme and different verticals (body and security of vehicles, fuel supply, IT materials and car interior). They have a training team for Continental Business Systems (CBS) – imbibing concepts of production, quality, related parameters – and also invite trainers from Germany and from the Philippines.

Deficiencies of ITIs

The representatives of Bosch believe that ITIs in India are not lacking funds but that their infrastructure needs to be better maintained. The BVC has had experience with Memoranda of Understanding with ITIs in which they took a few ITIs and improved them according to industry requirements. They organised affiliation tours with the government, and participated in fixing course curricula. Trainers in ITIs were given technical know-how, and were exposed to maintenance in a train-the-trainers programme; Junior Technical Officers in the government were trained in various skills (six to eight batches in a year). Bosch is also of the opinion that various associations such as The Automotive Component Manufacturers Association of India (ACMA), Karnataka Skills Council, the Confederation of Indian Industry and others could intensify their involvement in skills training. According to them, investment in training happens across a period of time, on the shop floor, in a few classes, etc. Furthermore, in certain sectors such as automotive, the amount of investment in training could be higher, while no significant investment is involved in fitting. Investment could be at around Rs. 50 million for four or five trades taken together. According to them, the problem is not the actual budget constraints but to quote, "the optimum use is the idea ...".

Large companies like Tata Motors and many members of the Federation of Indian Chambers of Commerce and Industry have already adopted ITIs and introduced very imaginative ways of running the courses by revising the modules, upgrading the technologies available and absorbing the outgoing students in remunerative jobs (see Box 3 on Tata Motors in Chapter 4).

2.8 Final Remarks

Shortage of skilled workforce

The micro-level field evidence from our survey in Bangalore, Chennai, Pune and Mumbai substantiates the macro picture of a shortage of skilled workforce in India's labour market. The companies studied respond to this skills gap in two ways: most resort to on-the-job training for new recruits, while some have in-house training programmes on the factory premises (though quality varies widely). With regard to the former, India clearly has the lowest level of in-company training among the BRIC countries of Brazil, Russia, India and China. However, our evidence suggests that as many as 30 of the 43 companies surveyed have in-house training of some kind. While large companies have organised training schemes with huge investments, smaller companies are satisfied with low levels of training.

Three major lessons:

The empirical evidence suggests three major lessons on how VET succeeds and fails to meet the skills gaps in the Indian labour market.

Assuring private participation

First, given the fact that there is a wide difference between theory and practice as explained by the companies, reforming the Indian VET has been of the utmost importance, which would be possible only by assuring private participation in the administration of the Indian VET system. Private companies expressed their interest in joining the preparation of curricula, codifying skills and practical training and thereby bridging the gap between theory and practice. However, we found limited evidence of this interest/intent.

Joint training programmes

Second, private companies are interested in joint training programmes, including joint investments in training, though some reservation was expressed by some larger companies already running well-organised training programmes. Large Indian companies have adopted ITIs and invested in infrastructure and training facilities. The members of the Federation of Indian Chambers of Commerce and Industry (FICCI) have already adopted several ITIs and have expressed an interest in taking over more of them, which would help to improve the Indian VET system in terms of infrastructure development, practice-orientation and industry-specific training programmes. The Confederation of Indian Industry (CII), too, has adopted more than 240 ITIs with the same purpose.

Cluster-based programmes

Third, small companies would do well to experiment with various forms of training schemes such as cluster-based programmes. Industry associations would be preferable to large employers' associations. They also expect the government to play an active role in coordinating or building nodal agencies to impart training. Companies expect a guaranteed return on the investment they make in training.

As companies invest in new technologies, the Indian VET system should become capable of accommodating them, which in turn requires the active participation of stakeholders through public-private partnership models.

Chapter 3

The Dual VET System in Germany: A Model for India?

Chapter overview

In this chapter, we give a short overview of the German dual system of Vocational Education and training (VET) and look for elements that are useful in the Indian context. Given the fact that 'borrowed models' pose problems of their own, we do not want to discuss replication of the German dual system as such. Instead, we aim to identify the most useful aspects of the dual system that would be relevant for India and could be successfully integrated into the Indian VET system. An entry point into the discussion is the study "Germany's vocational education system: a model for other countries" by Professor Dieter Euler published by the Bertelsmann Stiftung. The study identifies eleven core elements of the German dual system and discusses their potential for transfer.

In Section 1, we briefly discuss the German Vocational Education and Training system, Section 2 explains the eleven elements of the dual system as identified by the study, and Section 3 explains what elements are important for the Indian context and why.

3.1 Vocational Education and Training in Germany – a Brief Overview

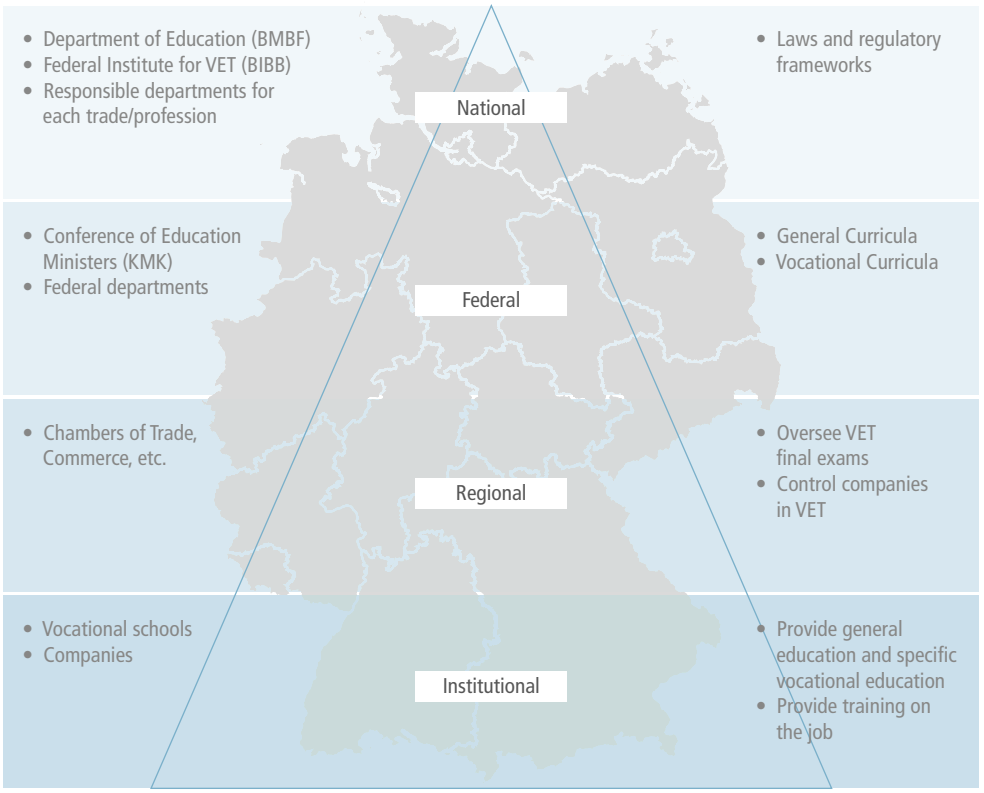
German VET system

Vocational Education in Germany is part of the national education system. Students commence training after 9th grade of school at the earliest. The courses last 2 to 3.5 years. The legal basis of the German VET system is the VET Act (BBiG) from 1969, which has been subsequently revised. In general, more than 50 per cent of those in upper general education opt for such vocational training. The two major pillars of the dual system are the workplace within a company and part-time vocational school. Learning at both venues is governed by distinct but coordinated regulations. The company provides practical training while the vocational school supplements this on-the-job learning with theoretical instruction. There are about 350 different occupations in the technical, agricultural, commercial and industrial areas. This also includes the public administration sector, health and social services. As a rule, trainees spend eight to twelve hours per week at school; the remaining time is spent at the actual worksite. To become an apprentice in the dual system, a young person has to apply to a company for an apprenticeship and sign a training contract. The right to attend the corresponding classes at the part-time vocational school is given automatically. The vocational course ends with an assessment held by an appropriate authority. The latter includes various chambers such as the Chamber of Trades and Handicrafts, the Chamber of Industry and the Chamber of Commerce, the Bar Association and the Schools of Administration. The relevant chamber will establish boards of examiners consisting of the representatives of employers, employees and at least one vocational school teacher for the final examination of the students.

Importance of co-determination

Generally speaking, co-determination of the employers' associations and trade unions in regulation, curriculum design, certification and funding form the building blocks of the German dual system. This co-determination is further reinforced by the fact that the VET is implemented by the Federal Institute for Vocational Education and Training (BIBB) through continuous dialogue and consensus between the stakeholders. The employers' associations and trade unions, who are partners in the policy governance of BIBB, exert considerable influence on the content and form of VET to ensure that their requirements and interests are taken into account. In particular, the Federal government recognises training occupations by ordinance and issues training regulations. The states (Länder) are mainly responsible for the curricula for the part-time vocational schools and funding of the teaching staff. Employers and unions draft proposals for training occupations and negotiate provisions concerning apprenticeships in collective agreements. The chambers supervise training in the company, training of instructors and administer examinations (BMBF 2011). The different levels of responsibilities and the corresponding tasks within the German VET system are illustrated below:

Figure 4: VET: Levels of Responsibilities



Source: Berufsausbildung sichtbar gemacht. Grundelemente des dualen Systems BMBF 2003 (p. 19).

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Tackling youth unemployment

The dual system approach has gained a lot of attention in the international discussion for its success in tackling youth unemployment. Countries with dual VET systems have the lowest youth unemployment rates. The dual vocational training system does not only ensure that the business world will have access to skilled workers with real-world training, but also facilitates young people's transition into the labour market. So it is argued that the dual model helps in reducing the skills gaps and unemployment and that it promotes growth.

3.2 Introduction of Euler's Approach

Eleven core elements

In his study for the Bertelsmann Stiftung, Professor Euler (2013) identifies eleven essential elements in the German dual system and suggests ways to export these elements to other countries in a modified form. These elements include

(1) Provision of vocational education as a means of achieving socio-economic and individual goals:
The broad objective of the German dual system is three-fold: economic productivity of the workforce, social integration and individual development of the apprentices, which forms the central reference point for the VET. It also integrates the interests of three major stakeholders – the state, the business community and students and parents –, thereby balancing their different goals.

(2) Production of skilled workers with flexible qualifications: The main objective of vocational training is to meet the practical needs of the labour market:
The training system is designed in such a way as to allow individuals to be flexibly employed in a wide variety of jobs within a certain sector which in turn meet the requirements of industry as well as those of the individuals concerned. This adds value to education in a non-academic context.

(3) Alternating learning situations in accordance with the dual principle:
In Germany, apprenticeships and vocational training are provided by vocational schools and companies according to the framework curricula (established by the Conference of Education Ministers) and training directives which provide an effective combination of theory and practice. Although occupational skills are aligned with the labour market, they are not "narrowly focused" on the requirements of business interests.

(4) Vocational training as a task to be carried out in private-public partnership:
This implies co-determination of the employers' associations and trade unions in a consensual manner for formulation of occupational profiles, conducting examinations, finding placements, etc. All of this contributes to raising the profile of VET and making it more acceptable to the public.

(5) Joint funding:

In Germany, VET is a dual system that is managed and funded by the government and companies. In 2007, for example, the states (Länder) paid Euro 2.9 billion, whereas the companies had a share of Euro 3.6 billion net expenditure (Euro 15.3 gross expenditure). While such investments form part of the recruitment strategy of the companies, they also lower the costs incurred by government.

(6) Complementary programmes run by schools:

There are two types: first, in addition to training under the dual system, certain sectors offer other types of training, e.g. school-based training in healthcare professions. Second, the government provides subsidiary training programmes that are run by schools or non-business entities if there is a lack of company-based training positions.

(7) Codification of quality standards:

The government ensures high-quality training via regulation of minimum standards and highly differentiated occupational profiles. This allows monitoring of standards and transparency.

(8) Qualification of teacher training:

The qualification of teachers in vocational schools is regulated at the Federal level. They usually hold a relevant university degree. Trainers in companies must hold a certificate of suitability, but the regulation here is much more limited.

(9) Balance between standardisation and flexibility:

Standards of training are to be flexible according to size, sector and other requirements based on diverse structural models. This would help meet the diverse requirements of business while maintaining minimum standards.

(10) Creating a solid basis for decisions and design:

The German vocational education system is supported by various research, planning and statistical tools and monitoring instruments. The Federal Institute for Vocational Education and Training (BiBB) acts as the interface between academia and policy makers here to ensure centralised changes to improve vocational training.

(11) Social acceptance of vocational education:

A high level of social acceptance is an important factor in the system's success. Although there are substantial differences in acceptance of vocational education across different occupations, there has been a fair degree of social acceptance on average.

3.3 Which Elements Are Important and Why

A model, not a blueprint

Not all of the above components are strictly replicable in other countries. The "modular approach" to transfer as presented with these eleven elements implies that there is no ideal vocational education system. Instead, customised solutions have to be adapted to the needs of a specific country. The present study identifies three focus components in Euler's approach that are adaptable to the Indian context.

Lessons learned

First, the main objective of vocational training is to produce skilled workers. Therefore, learning sites should be alternated in India in accordance with the dual principle in the sense of the integration of theory and practice. The dual principle can be implemented using various combinations of locations, with varying amounts of time spent at each, in different ways and to differing degrees, and periods of practical training in the company setting can be integrated into an alternate training system. Second, vocational education and training should be carried out in a public-private partnership where both the government and the private sector play active roles. Third, the costs for vocational training should be borne proportionally by both government and private enterprise.

3.3.1 Alternating Learning Situations in Accordance with the Dual Principle

The dual principle

In his study, Euler (2013) differentiates between the "dual system" and "dual principle". The dual system refers to specific institutional regulatory setup of vocational education, while "dual principle" means the way in which theory and practice are combined. As Euler suggests, although the dual principle is a core element of the dual system, it may well work in other vocational educational models as well. The application of the dual principle – theoretical training in vocational schools combined with on-site training in companies – provides apprentices with in-depth knowledge about the job and processes at worksites. Euler's dual principle implies the integration of theory and practice, thinking and acting as part of a single process. Conception and execution as a continuum is what is essentially embedded in German dual-system education.

Situation in India

The key element of the dual system that is needed in the Indian context is the mechanism which combines theory and practice effectively. Various studies (NSDC 2009 and Mehrotra 2013), including our own field survey, highlight the need of application and practice oriented vocational education in India. Industry involvement in training initiatives has been extremely low. For instance, India has the lowest level of in-company training among the BRIC countries of Brazil, Russia, and China. The share of companies that are currently providing on-site in-company training to their full-time permanent workers is only 15.9 per cent (World Bank, 2007). This share of Indian companies offering training is low as compared to that in other developing countries. There has even been a decline in the percentage of companies offering in-company training recently. Given the low value perception of vocational education in India, the introduction of large-scale changes in the education system is a difficult task. However, the Indian government has tried to change this. Policy makers' increasing awareness of the issue has begun to promote an integrated approach to theory and practice at schools and worksites.

3.3.2 Vocational Training as a Task to be Carried out in Private-Public Partnership

Role of the government and social partners

The regulatory framework of the dual system in Germany evolved over time in response to the changes in the economy and in the needs of the labour market. The core structure of the vocational training system is the continuous alternation between training in vocational schools and training in companies. The public-private partnership between the different government levels and social partners in Germany works well in terms of curriculum-building, certification and funding. The Ministers of Education and Culture of the states (Länder) cooperate in a Standing Conference (KMK) to ensure a certain measure of codifying skills, standards and curricula at vocational schools along the lines of the training regulations of the Government and the Institute for Vocational Education Training (BIBB). The latter coordinates across regions and locations. It is worth noting that the various stakeholders, including the employers' associations and trade unions are partners in the policy governance of BIBB and thereby ensure that their requirements are met. The entire system of VET is governed by a well-coordinated institutional legal mechanism. This has historically been the case and was further strengthened by the VET Act (BBiG) from 1969, which has subsequently been revised. Responsible actions of all participants in the system are built on the foundation of a long-term welfare objective. This generates harmony among various stakeholders on the issue of modernisation of vocational training on the basis of technical, economic and social developments.

Apprenticeship Act in India

In India, there is neither continuous alteration between vocational schools and companies nor is there any well-working systematic mechanism that ensures coordination between different government levels, social partners or other stakeholders. There is the Apprenticeship Act (1961), but its implementation leaves much to be desired. An institutional mechanism that ensures coordination between public and private actors as well as between different levels would be desirable in the Indian context as well.

3.3.3 Joint Funding

Partnership between government and economy

The most desirable element of the German dual system is the partnership between government and economy in sharing the vocational training cost. In Germany, the government and the business community contribute in different ways to financing vocational training. It has recently been reported that the German government contributes around 20 per cent of the total costs of vocational training; the bulk of the cost, at around 80 per cent, is contributed by private entities. As practical training takes place on private work sites, it is simultaneously a cost-sharing and curriculum-design mechanism. The private sector also contributes to codifying skills processes, standardisation and curriculum design. Furthermore, the private companies have self-governing bodies (e.g. Chambers that cater to a single industry) to take care of organisation, inspection and supervision of vocational training in private enterprises. Private enterprises directly benefit from providing vocational training. The business community in Germany sees financing vocational training as an investment rather than an expense. The money spent by companies is offset by the

increased productive contributions of their trainees and other factors that generate benefits for the respective business. This has also been quoted as one of the prime reasons why Germany leads other European countries in terms of industrialisation.

Situation in India

While public-private participation in Germany has been capable of meeting skills requirements through cost sharing, India has been averse to such partnerships until recently. For a long time, there had been no move from the government to persuade the private companies to share the cost of training; nor had the private companies shown any wish to work with each other in terms of cost sharing. There has been some development recently during the 11th Five-Year Plan period in the form of Institutional Management Committees for governmental Industrial Training Institutes (ITI), on which the local private industry is represented. However, as Mehrotra (2014 forthcoming) indicates, experience with this PPP-model has been mixed.

3.4 Final Remarks

There are wide differences in practice between VET in Germany and India. However, there are many lessons that India could learn and adopt from the German dual system.

Integration of theory and practice

First, Germany uses the dual system and the dual principle, organised in such a way that formal theoretical knowledge is provided in vocational schools run by the state, while practical knowledge is acquired at the workplace. The Indian VET lacks this kind of integration of theory and practice and hence requires a redesign of its VET to create a theory-practice continuum among classrooms and worksites, approximating Euler's notion of the dual principle.

Institutionalised form of cooperation

Second, vocational education and training is based on a well-coordinated system where all relevant actors are involved. In India, such an institutionalised-legalised form of cooperation is missing. Curricula are developed solely by the government without any participation of employers or a large number of stakeholders. Coordination between regions is weak. Without a coordinated effort by public and private actors, it is difficult to create a skilled manpower that meets the demand of the Indian industry and ensures comparability of acquired skills.

Cost sharing

Third, in Germany, companies contribute the lion's share of the costs of vocational education and training. In India, companies are rather reluctant to contribute to funding of vocational education and training. In the eyes of many companies, training activities should be funded be the government alone. Funding of training activities is not seen as an investment, but as an expense. In the end, companies are the main beneficiaries of a skilled workforce, however, since more qualified manpower can increase their economic productivity.

Chapter 4

Adapting the Elements of the German VET System to the Indian Situation

Overview of the chapter

In this chapter, we give a brief overview of the Indian system with its strengths and weaknesses and highlight the need for a major overhaul of the system. We also discuss elements of the dual system which could be integrated into the Indian system with a focus on Euler's approach. Furthermore, we present 'best practices' in India and abroad. Section 1 provides an overview of the Indian VET system. Section 2 examines what needs to be done in the Indian VET situation to guarantee more practical experience and work-based learning. In Section 3, we address the question of how best to involve companies in administration of the Indian VET-system and in the design of curricula for individual professions. Section 4 discusses how to involve companies in the funding of VET in India, how cost-sharing between governments and business may work out and how companies could be motivated to accept cost sharing.

4.1 Vocational Education and Training (VET) in India

Two forms

One must distinguish between two forms of vocational education. Within the formal education system, vocational education in India usually starts after secondary school level, and is offered at school level in 11th and 12th grade. Outside of the school system, vocational training takes place in institution-based training programmes. In the latter, the period of training for various trades varies from six months to three years. Entry qualification varies from 8th to 12th grade, depending on the requirements of training in different trades. Vocational training is mainly provided through government and private Industrial Training Institutes/Industrial Training Centers[5] and polytechnics. While the vocational education within the formal school system lasts three years if begun in the 11th year, vocational training lasts for one to three years depending on the chosen trade. The core responsibility of running vocational education and training in India lies with the Ministry of Human Development (MHRD) and the Ministry of Labour and Employment (MoLE).

Cooperation of ministries

As in many other developing countries, the two ministries – the MHRD and MoLE with whom the core responsibility of coordinating the VET lies – are often badly coordinated.[6] The MHRD controls the vocational higher education including polytechnics and graduates in engineering through the All India Council for Technical Education (AICTE). The AICTE prepares curriculum design, certification and standardisation of syllabuses. It also monitors the entire vocational higher educational structure. The ministry also controls vocational education in the secondary schools

5 Industrial Training Institutes (ITI) are training providers established by the government, whereas private ITIs are also training providers but managed by private players on a self-financing basis. These private ITIs are sanctioned and regulated through the Craftsman Training Scheme (CTS) by Directorate General of Employment & Training (DGE&T), MoLE 2009, 2011; also see Adams 2011; Jamal and Mandal 2013.

6 This was in evidence for almost two years (2011–12) in respect of the competing claims by the two ministries in regard to a qualifications framework for VET.

through National Council for Education Research and Training (NCERT) which prepares curricula, certification, etc. for vocational education at secondary school level.

ITI & NCVT

Similarly, the Ministry of Labour and Employment (MoLE) regulates and monitors the lower end of vocational educational training such as the ITIs through the National Council for Vocational Training (NCVT). The NCVT is mandated to design, develop and maintain curricula and monitor ITIs across the country. The same ministry also regulates apprentice programmes for those who graduate from ITIs and others through its Craftsmen Training Scheme (CTS)[7].

Training schemes

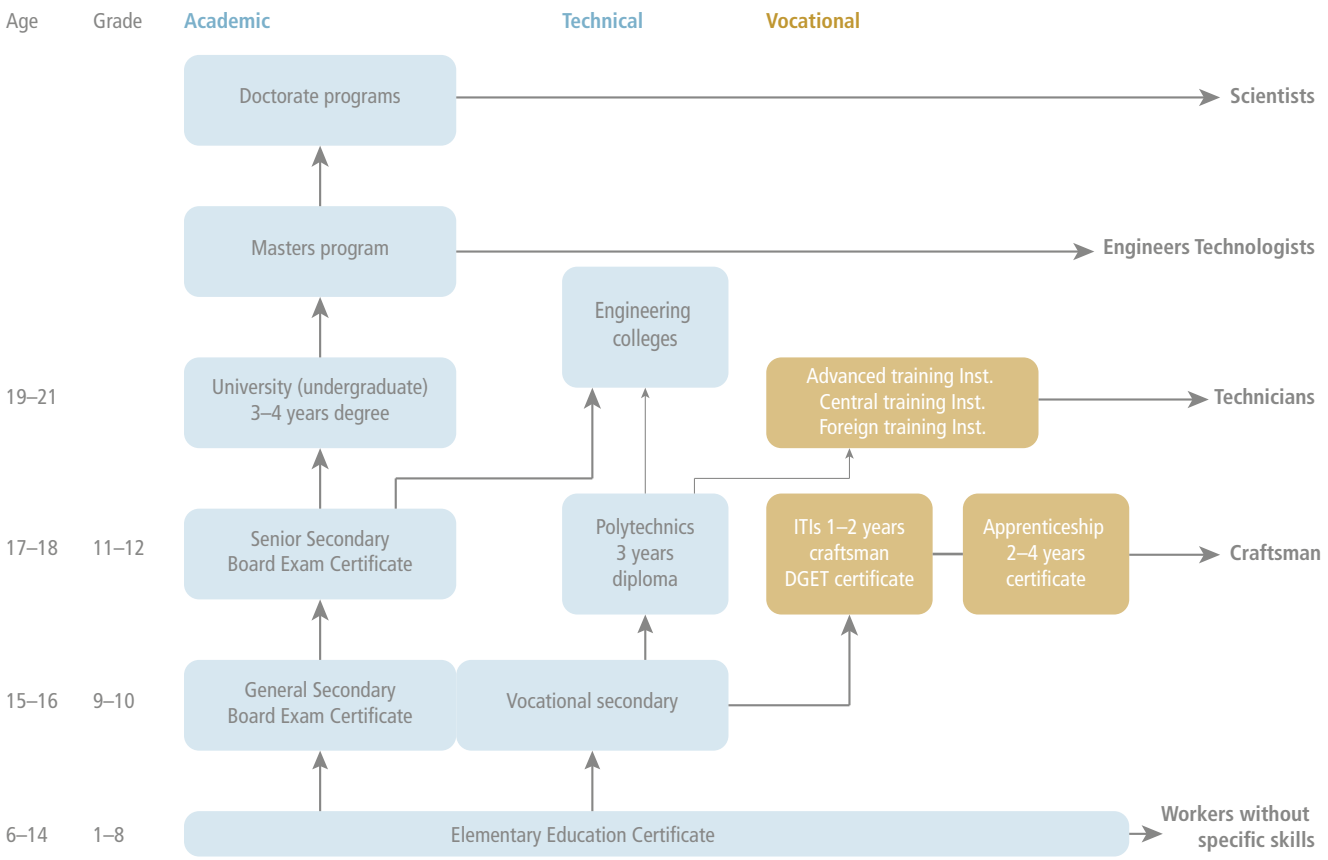
After successful apprentice training, the trainees are expected to appear before the All India Trade Test (AITT). The NCVT provides the certificates for those who pass these exams. Another training scheme under the ministry is the Skills Development Initiative Scheme (SDIS). The scheme is targeted at workers seeking skill upgrading or certification of skills acquired informally through courses run by Modular Employable Skills. The trainees who graduate from such training programmes receive certificates from NCVT. The relevance of either joint curriculum building or a joint certification scheme with the involvement of various stakeholders has only been determined very recently in India.

National Skills Development Agency

A third component of the regulatory framework came into being with the establishment of the Prime Minister's National Council on Skill Development in 2009. This body later (in June 2013) became known as the National Skills Development Agency with autonomous status and a parliament mandate. The agency is expected to coordinate and harmonise the skill developments in the country, and to foster cooperation between the government and the private sector in order to meet skills needs. It is also expected to anchor the National Skills Qualifications Framework (NSQF) and facilitate the establishment of professional certifying bodies in addition to the existing ones. The governance structure of the Indian VET as a part of the overall education system is depicted in the following Figure 6:

7 The main objectives of the CTS are to provide skilled craftsmen to industries according to their requirements, as well as to provide self-employment opportunities to educated youth by giving them industrial training. The programmes under CTS focus on industrial trades and are operated by ITIs, both public and private. After completion of the ITI course, students appear for a test conducted under the aegis of the National Council for Vocational Training (NCVT) and successful students receive a National Trade Certificate.

Figure 5: Education and Training System in India



Source: World Bank 2007

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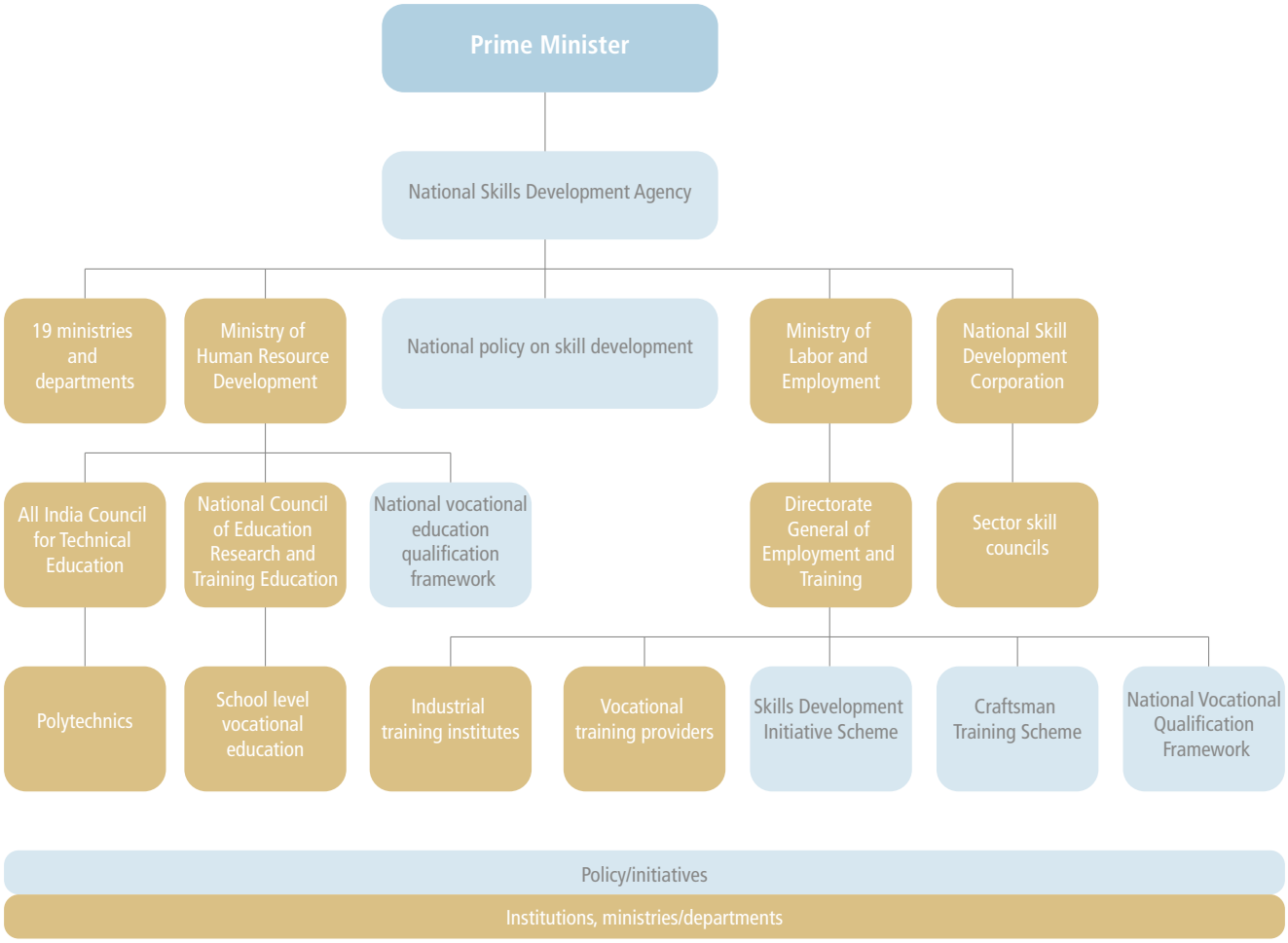
Figure 6: Technical and Vocational Education System in India



Note: MHRD regulates polytechnics and school-level vocational education while MOLE regulates Industrial Training Institutes and Vocational Training Providers

Source: Institute of Applied Manpower Research

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Apprenticeship Training Scheme

The Apprenticeship Training Scheme (ATS) of the MoLE aims to provide training facilities to as many people as possible in different trades in various enterprises under the Apprenticeship Act of 1961. The ATS and the training of skilled workers under the Advanced Vocational Training Scheme (the fields of Industrial, Medical and Consumer Electronics, and Process Instrumentation) are implemented jointly by union territories/state governments and the central government. There are four categories of apprenticeship trainees, namely trade graduate, technician, and technician (vocational) apprentices.

Craftsman Training Scheme

To date, 254 groups of industries are covered under the Apprenticeship Act of 1961, with about 31,587 enterprises employing apprentices (MoLE 2011–12). At the moment, apprenticeships are available in 252 trades (Mehrotra et al forthcoming). The main objectives of the Craftsman Training Scheme (CTS) are providing skilled craftsmen to industries according to their requirements and providing self-employment opportunities to educated youth by giving them industrial training. The programmes under CTS focus on industrial trades and are operated by ITIs, both public and private. Successful students receive a National Trade Certificate (Mehrotra et al forthcoming). The number of ITIs/ITCs has increased tremendously in recent years, though it is still not enough to fully cover demand.

As described, the system in India faces challenges. A modified version of some elements of the German dual model could help to overcome problems in India with respect to the lack of combination of theory and practice, cooperation between public and private actors and joint funding.

4.2 Alternating Learning Situations in Accordance with the Dual Principle: Combining Theory and Practice in the Indian VET

Skills and demands of industry

A number of problems affect the vocational education and training system in India. Within the formal structure of skills development, graduates from ITI/ITCs have difficulties in finding a job because their skills do not meet the demands of the industry. Polytechnics also face major problems such as the non-availability of courses in new and emerging areas, inadequate infrastructure and obsolete equipment, inadequate financial resources, inadequate or non-existent state policies for training and retraining of faculty and staff, inadequate industry institute participation, lack of research and development in technician education, and antiquated curricula (Goel[8]). The pillars of the German dual system – practical training in the workplace combined with theoretical learning in vocational schools – which also form the critical elements of Euler's duality principle should be incorporated into the Indian VET system.

Deficiencies of Indian VET

The Ministry of Human Resources and Development (2011) has identified the following reasons for the poor performance of Indian VET:

8 http://www.unevoc.unesco.org/up/India_Country_Paper.pdf , accessed in October 2013.

(1) Training versus education: Vocational training is treated as distinct and separate from general education. However, to work in a professional environment and do many jobs effectively, one needs to have a certain minimum of both, i.e. theoretical knowledge of systems as well as the practical (skills training). It is seen that graduates of ITIs and even private vocational education are given certificates distinct from those of general education, making these dead ends.

(2) Industry and job linkages: The vocational training institutes, which aim to prepare students for jobs, often do not have close links to industry and understanding of employers' needs. Hence, the training provided is based upon outdated perceptions of what is needed or on a centralised decision making process.

(3) Redundant and inadequate curricula and faculty: The curriculum has remained static for years, not reflecting current requirements. Moreover, quality and robustness of curriculum varies and often leads to uneven delivery depending upon the teacher's interpretation and capability. Facilities and labs are behind times, resulting in ill-equipped graduates.

(4) Poor quality: Lack of strong teachers and pedagogy as well as facilities lead to uneven quality. It is argued that the teachers need to have regular refresher training courses in theory and practice.

National Skills Development Corporation

The attempt at linking theory and practice has been successful to some extend in recent years with the formation of the National Skills Development Corporation (NSDC) in 2010, with participants from relevant central government and state government ministries, as well as private sector representatives. First, it is meant to proactively catalyse the creation of quality vocational training providers (VTP) in the private sector. Second, it is intended to be an enabler for building support systems required for skills development. Such support systems include Sector Skills Councils (SSC)[9], quality assurance, information systems, training trainers and setting standards. A few of the SSCs are also liaising with international organisations such as the European Union, International Labour Organisation, the UK-India Education and Research Initiative, etc. with the objective of introducing best practices in India.

International examples

Regarding the question of linking theory and practice, India can also learn from foreign countries which have adapted these elements of the German dual system. With support from the German Technical Cooperation (GTZ), Egypt has introduced the Mubarak Kohl Initiative – Dual System (MKI-DS) which was targeted at students from low-income families (Adams 2011). In this project, students spent two days each week in school learning theory and four days in a factory where they acquired practical skills. In contrast, students in traditional secondary technical schools in India spent six full days in school for theory and practice. In order to create a theory-practice continuum in the Indian context, the central and state governments should be ready to give up their monopoly over designing modules and codifying skills. The participation of various stakeholders is to be ensured in the administration of the Indian VET-System.

9 SSCs are employer-led and state-sponsored organisations that cover specific economic sectors and are meant to complement the existing vocational education system. They directly address the skills gaps by conducting research, improving the delivery mechanism and assuring quality in order to boost the skills of their workforce and improve their productivity (http://www.nsdcindia.org/pdf/approach-paper-ssc.pdf).

4.3 Vocational Training as a Task to be Carried out in Private-Public Partnership: Enhance Public-Private Cooperation

Public-private cooperation in India

The situation in India is quite different from the German model that carries out vocational education and training in a public-private partnership. First, the design of curricula and preparation of modules is carried out by the Ministry of Human Resources Development (MHRD) without any participation from the large number of stakeholders who are directly and indirectly linked with the vocational education system. Second, there is no consultation with the actual employers with regard to the content and standard of the curricula to be followed in the vocational schools. There has already been a proposal in this direction. The Federation of Indian Chamber of Commerce and Industries (FICCI) has already taken over many Industrial Training Institutes (ITIs) in India and has expressed interest in running many more. Industries have been advised to take over ITIs, redesign curricula and update the teaching materials in light of their skills needs. There has also been an attempt to codify national occupational standards (NOS) laid down by employers: the performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underlying knowledge and understanding. This task is currently being tackled in India, with the Sector Skills Councils (SSCs) taking the lead with responsibility for bringing together all stakeholders to achieve the common goal of creating a skilled workforce for the domains they represent under the overall supervision of the National Skills Development Corporation (NSDC), formed in 2008.

BBiG in Germany

There are also other international examples that could serve as a role model. German chambers engage in self-regulation. SSCs have to learn from them and adopt a method of regulating themselves towards the goal of preparing curriculum design, certification and standardisation of syllabus for which the local industry must be encouraged by the central and state governments to the introduction of new courses relevant to the industry. The government should also make sure that private companies actively participate in the curriculum-building process. Joint certification is equally important, made possible in Germany through the Vocational Education and Training Act (BBiG) which enables joint certification of skills and competencies. This strongly suggests the necessity of passing a VET Act for joint certification as all certification in India has been done by government so far without any private participation.

Box 3: Tata Motors

The vehicle manufacturing complex produces various ranges of commercial vehicles, including the Indigo and Indica passenger vehicle models. Tata Motors established its Pune unit in 1966 to manufacture commercial vehicles, which was later expanded to produce passenger cars as well. The unit has the most versatile tool-making facilities and vehicle manufacturing complex in the subcontinent. It is currently engaged in the design and manufacture of sophisticated press tools, jigs, fixtures, gauges, metal pattern and special tools.

The plant has about 6000 employees, 90% of whom are blue collar workers. It has a fully equipped industrial training centre on its premises and most of the workers are the product of this training centre. It has a long tradition of investing in vocational training and capacity building in the country. For instance, at the moment, it has adopted about 137 ITIs across India. They are adopted under Public Private Partnership (PPP) models. According to this model, Tata Motors provides modern infrastructure for those adopted ITIs and helps in designing curricula according to the needs of the industry and in training their trainees. It also facilitates new vocational courses. For instance, some of the courses it has introduced include Motor Mechanic Vehicle, Diesel Mechanic Trade, Fitter and Automotive Electrician. These courses were introduced to ensure uninterrupted flow of skilled workforce to its large scale network based dealers placed across India.

Training Centre facility: The training centre is designed on the model of an ITI. It has about 23 qualified trainers coming from various disciplines. The centre has fully equipped instruments and other infrastructure. Trainees are given a stipend of Rs 4,500 per month. Boarding and lodging facilities are available on the company premises. The trainees take theoretical classes in their respective trades and experiment with those concepts in the practical sessions in the workshop. At times, they are taken to shop floors in the factory for on-the-job training.

4.4 Joint Funding: Involving Companies in the Funding of VET in India

In contrast to the German experience, the private business community's involvement in vocational training is very low. In particular, its contribution to financing vocational training is next to none. Pre-service technical and vocational training and education (TVET) have been financed by the state through general tax revenues. Euler's dual system involves partnership between governments and private enterprises. This is desirable and replicable in the Indian context, provided that a concerted policy framework is developed as in the case of other best practices abroad.

PPP-initiatives in India

There have been a few initiatives in India for collaboration on the PPP model (public private partnership) with the formation of the NSDC with 51 per cent of its equity by private sector and the rest by the government. It has been funding the creation of Vocational Training Providers[10] in the private sector by lending capital in the form of equity and loans. In order to financially support NSDC, a National Skills Development Fund was developed as a Trust under the Indian Trusts Act with an initial corpus of Rs 9,951 Million. The NSDC has so far approved 18 SSC proposals for funding which cater to the requirements of 18 identified high growth sectors including manufacturing and services. There has also been an attempt to promote the adoption

10 A Vocational Training Provider could be any agency/institution including ITIs desiring to deliver vocational training based on National Occupation Standards as crafted by a Sector Skills Council. VTP can affiliate one or more courses to a SSC. Thus, there can be multiple affiliations of a VTP with an SSC. VTP is partially funded by NSDC.

of existing ITIs by the business community. The members of the Federation of Indian Chamber of Commerce and Industries (FICCI) have already taken over many Industrial Training Institutes (ITIs) in India and have expressed an interest in running many more (see box 3 on Tata Motors). It is also worth noting that the existing ITIs were upgraded under the scheme of the Vocational Training Improvement Project with support of the World Bank. Similarly, about 1,400 ITIs were upgraded in the Public Private Partnership (PPP) mode (Policy Overview 2011). Their performance is pending review.

International examples

As Mehrotra and Ghosh (2012) have suggested, the PPP funding model could take other forms as well: about 62 countries around the world have already put some form of training levy in place. Some large economies, such as Brazil, have had a training fund for over half a century. South Africa has had one for at least ten years. The proposal by Mehrotra and Ghosh (2012) to set up a National Training Fund could take one of several forms such as pre-employment training fund, Enterprise Training Fund, Equity Training Fund, etc. The specific design depends on the active involvement of the private business community in financing such skills development initiatives within an institutional and legal framework. As Mehrotra and Ghosh (2012) pointed out, the beneficiaries of NTF should include both organised and unorganised enterprises. It is the large and medium-sized organised enterprises who would contribute the major share of the NTF. The unorganised sector, however, will also need to benefit from the disbursements of the fund.

Training expenses as an investment

Companies in India need to see training expenditure and the cost of sharing expenditure as an investment rather than an expense, as is the case of Germany, China and Egypt. The money spent by companies is offset against the increased productive contributions of their trainees and other factors that generate benefits for the respective business. This also has been quoted as one of the prime reasons why Germany leads other European countries in terms of manufacturing, a trajectory that India will need to emulate if India is to become a major manufacturing nation.

Box 4: Sino-German Automotive Vocational Education Initiative

The Sino-German Automotive Vocational Education (SGAVE) project was initiated by German companies in 2011. The project was commissioned by the Federal Ministry of Economic Cooperation and Development of Germany in collaboration with the Ministry of Education of the People's Republic of China, supported by German car manufacturers such as Audi, BMW, Daimler, Porsche and Volkswagen. These private partners cover about 50 per cent of the project cost.

4.5 Final Remarks

Need for private participation

India not only lags behind Germany in developing an integrated VET system but also lacks a coherent strategy to bridge the gap. Unlike Germany, the Indian vocational educational system does not provide much scope for the entry of private companies into the area of vocational education unless a legislative basis is provided. Since the German chambers self-regulate, Sector Skills Councils (SSCs) must learn from them and adopt a method of regulating themselves towards the goal of preparing curriculum designs, certifications and the standardisation of syllabuses. This shows that India must pass a VET Act for joint certification, as all certification has been performed by the government without any private participation.

National Skills Development Agency

The significant progress in Indian vocational training and skills development came out of the formation of a National Skills Development Agency (NSDA), an autonomous body with the mandate of the Indian parliament. It is expected to coordinate and harmonise the skills development efforts of the government and the private sector to achieve the skills requirement of the economy. With the support and guidance of NSDA, the National Skill Development Corporation (NSDC) was established in the Public Private Partnership (PPP) mode with the intention of bringing in private sector initiatives into skill development. About 51% of the NSDC's equity are held by the private sector and 49% by the government. The funds are channelled to training not as grants but instead as loans and equities. Hence, the funds are "re-circulating", which should perhaps be treated as one of the strengths of the recent reforms of the Indian VET. It is equally important to develop imaginative schemes such as National Training Funds by charging training levies, particularly on medium and large companies; small companies should also be allowed to access such funds.

Involving the private sector

The NSDC is expected to involve the private sector and create capacities for skills development in various sectors, including the high growth sectors, through appropriate mechanisms with active support of private players including employer organisations like FICCI and CII. It has identified 21 high-growth sectors and has plans to set up Sector Skills Councils (SSCs) for these sectors. For some sectors, the SSCs have already been set up. SSCs are industry-led and supported bodies are expected to support the existing vocational education system for the Industry Sector in meeting the skills needed in each sector. While the question of how to motivate the companies to participate in the Indian VET has been a subject of discussion for several years and some progress has been made, there is still much work to be done in this area.

Chapter 5

Final Remarks and Recommendations

Skills gap in India

India adopted a National Skills Development Policy in February 2009 which aims to guide skills development strategies and initiatives of all stakeholders and which has set the ambitious target of skilling 500 million people by 2022 (MoLE 2009)[11]. In another estimate (Mehrotra et al 2013), the number of people to be skilled by 2022 in the working age group comes to around 291 million. The common concern expressed by policy planners and industrialists is that there is a pronounced 'skills gap' in India both in terms of quality and quantity, and current vocational education and training infrastructure is not geared to meet industry requirements (CII report as cited in MHRD 2011). This necessitates a radical restructuring of VET in India with a long term perspective.

Differences between Germany and India

The differences in the structure of the economies of Germany and India, the stage of industrialisation, and the expanding size of informal sector(s) should also be taken into account when thinking about adopting the favourable elements of the German dual system. This is particularly so because the Indian education system entails a certain degree of path-dependency which does not provide seamless mobility between vocational and general education. Neither does India have a Vocational Education and Training Act like that of Germany or China. The organised segment of Indian enterprises employing more than ten workers accounts for 78 per cent of all value-added in the non-agricultural sectors. However, they employ only 18 per cent of all non-agricultural workers. On the other hand, the unorganised enterprises (which are very small in size) account for only 22 per cent of value-added in output, but employ 82 per cent of all non-agricultural workers. This shows that the structure of Indian industries is very different from that in Germany.

Limits of adaptation

Given this background, it is important to understand the specific aspects that need to be considered when adapting certain elements of the German dual system in India. Our primary survey was mainly of companies that are in the organised segment of manufacturing industry. We have explored those elements in this report – combining theory and practice, joint participation in curriculum-building and certification and more importantly, joint funding – between the private companies and the government. It has turned out that Germanys dual system by and large offers great insights for reforming VET in India. We have also found that India has already begun reforming its VET system, though it is too early to assess the success of these reforms.

Lessons to be learned and recommendations

Assuring duality principle

In India, the practical component of vocational education and training is mostly missing. The duality principle should be made mandatory in India. Germany can serve as a role model in this

11 MHRD estimates that approximately 75 to 80 million jobs will be created in India over the next five years. 75% of these new jobs will require vocational training to enhance employability prospects (MHRD 2011). Even if this 75 million estimate is overly optimistic, given that new non-agricultural jobs created between 2000 and 2012 have been only 7.5 million per annum on average, the fact remains that new jobs require skilled persons, while those already in the labour force also need access to VET.

respect. Practical training must be built into the Vocational Education and Training system for which the state and industry associations should play a key role.

Enhancing public-private partnerships

Both the government and private companies should come to a consensus regarding the standards to be followed with respect to the structure and content of courses and how they should be made integral to practical training. A closely related issue is the relevance of joint certification. Industry must be on board during certification as well, since this is where the major employers are located. Unless there is practical training at the work sites combined with classroom teaching in schools, the private sector would not be able to participate in joint certification. To ensure the organic involvement of private companies, the government must understand how the duality principle could prove to be an agent for change. It will also promote transparency of qualifications and facilitate learner mobility between different qualifications, thus encouraging lifelong learning. In India, the National Vocational Education Qualification Framework (NVEQF) developed by the Ministry of Human Resource Development (MHRD) provides a descriptive framework for linking various qualifications to set common principles and guidelines for a nationally recognised qualification system. This would cover schools, vocational education and training institutions, technical education institutions, colleges and universities. The MHRD, in alliance with the state governments, have already initiated the NVQF with more than 1,000 VET schools. However, although the Automotive Sector Skills Council (SSC) has been preparing National Occupation Standards, industry participation is nearly absent from curriculum-building. To change this, the SSC must be activated across sectors with the support of the National Skill Development Corporation (NSDC). It is encouraging to see that a SSC has already been set up in the automotive sector and the Central Institute of Vocational Education Bhopal has developed the modules and standards; yet, industry participation in this sector is still very low.

Developing a comprehensive VET Act

The regulatory system in Germany with involvement of the Federal, regional and local governments and the various stakeholders offers lessons for the development of an institutionally and legally embedded VET in India. An Indian VET Act can be passed along the lines of the German VET Act which would integrate governance strategies. India is in urgent need of a legally embedded VET system such as the Vocational Education Act (BBiG) in Germany. It would be particularly helpful in mandating private-sector participation in training. It could also provide legal sanction to the introduction of joint certification by government and private institutions, which is another feature of Germany's VET system. Such certification would facilitate the placement of students/trainees in enterprises, as the latter would have greater confidence in the competencies of trainees whom they have certified.

Joint funding: creating a National Training Fund

Establishing a National Training Fund for skills training is seen as a way to generate funds from private players for vocational training. This has also been suggested in the 12th Five-Year Plan of the Planning Commission (2013). The German construction sector has this kind of a sectorial fund to which all companies must contribute. Its resources are returned to construction enterprises to enable them to provide training. On a national level, for instance, the National Skills Fund (NSF) of South Africa serves as an example where payroll levies are directed towards including all sections

of society. Twenty per cent of the training payroll levy on formal sector enterprises is sent directly to the NSF and 80 per cent go to sectorial authorities (see Mehrotra and Ghosh 2012). Similarly, about 62 countries around the world have already put some form of training levy in place. Some large economies, such as Brazil, have had a training fund for over half a century. South Africa has had it for at least ten years. Mehrotra and Ghosh (2012) have pointed out that the levy for NTF in India may start from the organised manufacturing sector since it accounts for about 78 per cent of the total manufacturing output. Large as well as small and medium-sized companies should contribute to the fund. Given the fact that the organised sector accounts for only 15 per cent of the total manufacturing employment in the economy (Mehrotra et al, 2012), while the remainder is contributed by the informal sector, the authors have suggested the development of a policy framework to decide which of the companies are to be included in the levy framework depending on the turnover and employment numbers. Beneficiaries of the NTF should include both organised and unorganised enterprises. The training levy funds should also be used for funding students from poorer backgrounds who would be unable to bear the opportunity cost of undertaking training first before entering the labour market. This should also motivate parents to send their children to VET schools. The National Skill Development Corporation, the Federation of Indian Chambers of Commerce and Industry (FICCI) and the Confederation of Indian Industry (CII) should cooperate with think-tanks working on employment/employability issues to develop the design of a NTF for India to address the long-term problem of skills shortages.

Training the trainers

Teacher training is a strong component of the German dual system to be adopted in India. India's VET faces a serious shortage of teachers. The problem that teachers themselves have had little or no practical industry experience is even more serious. This is the opposite of the situation in Germany or China. Local industry must contribute, for example, by offering trainers with industry experience to vocational schools to introduce new courses relevant to the needs of local industry.

Creating cluster-based training for small and medium-sized companies

Cluster-based training is another possibility for small companies to get a sufficient number of trained personnel. For instance, they could develop a cluster-based training approach where a few companies from a particular area can jointly generate training programmes through cost sharing. Companies should be convinced of the fact that either a common platform or a sectorial approach – with training based on clusters – would be a better than the current practice of in-house training or competing for skills on the open labour market (22 companies in our primary survey expressed interest in inter-industry collaboration). In this context, the two variables of incentives and regulations become important. One of the advantages of cluster-based and location-specific industry-level decision making is that it is easy for companies to effectively assess the local demand and supply of manpower to be trained. Second, it is easy to bring the entire training system under a locally governed legal framework. The Micro, Small and Medium Enterprises Ministry of the central government could facilitate this, even though the local companies should take the lead in such institutional arrangements.

Involving employers association and large companies in upgrading training institutes

In certain sectors, such as engineering, the employers' association has taken particular interest in advancing training programmes. The Federation of Indian Chambers of Commerce and Industry (FICCI), has adopted several Industrial Training Institutes and has expressed interest in taking over more of them. It is true that they benefit by way of free capital cost in the form of buildings, machinery, etc. Given the fact that they run efficiently and are more widely accepted, it is a policy which could be encouraged. In this context, we would recommend that there should not be any discrimination between Indian and foreign companies, as the public good is accessible for all the companies. Large individual companies can also adopt ITIs. Tata Motors, for instance, has adopted nearly 137 ITIs in the country. This model has turned out to be successful in terms of financial assistance, training orientation and diversification. Infosys and Bosch offer good practices for large companies. The PPP model implicit in the above cases could be modified in a similar way to be embedded in the larger process of modernisation of the economy.

Integrating skills training in the Companies Act

The Indian Companies Act (2013), as ratified by parliament, prescribes an expenditure of two per cent of profits on Corporate Social Responsibility activities in their respective areas of operation. Though the new regime would replace the 57-year old Indian Companies Act of 1956 and usher in more transparency in corporate bodies in addition to creating a new business environment for growth, the issues of either skill training or VET reforms are not adequately addressed. It would be desirable to develop a "negotiated corporate social responsibility" (Raman 2010) and thereby neutralise whatever adverse impacts the PPP model is likely to have. The experiments of Tata Motors, Infosys, SAP and Bosch also signal the potential of modified forms of public-private partnerships and corporate social responsibility.

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About the Bertelsmann Stiftung

The Bertelsmann Stiftung promotes social change through project work that focuses on ensuring society's long-term viability. Working with a wide range of partners, the foundation wants to identify social problems and challenges early on and develop exemplary solutions to address them. We view ourselves as an initiator and driver of necessary reforms. We rely on knowledge and expertise to stimulate lively dialogue on the most pressing issues of our day and provide policymakers with new momentum.

Within the field of education at the Bertelsmann Stiftung, the Learning for Life programme addresses career guidance in schools, school-to-work transitions, Germany's dual vocational training system and life-long learning. The foundation initiates and moderates discussions on these issues, provides professional insight by way of expert opinions, and supports the exchange of ideas on the international level.

The programme "Germany and Asia" of Bertelsmann Stiftung focuses on India and China. It analyses developments in Asia and assesses their impact on Europe and Germany in particular. Furthermore, it aims at fostering exchanges and dialogues in various issue areas and between different actors from all sections of society.

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List of Companies (survey)

State, Region	Company	Year of establishment	German, Indian, Joint Venture	Large, Small & Medium	Products	Sector
Karnataka, Bangalore	Continental Automotive Components (Pvt) Ltd		German	Large	As a supplier of brake systems, systems and components for powertrains and chassis, instrumentation, infotainment solutions, tires, and technical elastomers	Automotive and automotive components
Karnataka, Bangalore	Continental Automotive Components (Pvt) Ltd		German	Large	Vehicle electronics	Electronics
Karnataka, Bangalore	Siemens Technology and Services		German	Large	Siemens Technology and Services Private Limited (STS) combines four units: Corporate Technology India, Siemens Corporate Finance and Controlling, Global Shared Services, and Siemens Management Consulting	IT
Karnataka, Bangalore	Festo Controls Pvt. Ltd		German	Large	Pneumatic and electric drive technology	Electricals
Karnataka, Bangalore	Baka Liftec		Joint Venture	Large	Manufacturer, importer, exporter, supplier and distributor of a premium range of Battery Operated Pallet Trucks, Battery-operated pallet trucks, battery-operated stackers, battery-operated counterweight stackers, battery-operated die loaders and hydraulic hand pallet trucks, hebel rollers, scissor lift tables, etc.	Other
Karnataka, Bangalore	Tech Mahindra		Indian	Large	Provider of solutions and services in the Information, Communications & Technology (ICT) industry	IT
Karnataka, Bangalore	WIPRO		Indian	Large	Information technology, consulting and outsourcing company	IT
Karnataka, Bangalore	Kluber (Frudenberg)		German	Large	Speciality lubricants	Chemicals
Karnataka, Bangalore	SAP	year	German	Large	Provider of business software solutions	IT
Maharashtra, Mumbai	Mahindra Auto and farms Ltd	Before 1947	Indian	Large	Manufacturing tractors	Automotive and automotive components
Maharashtra, Mumbai	Eagle Burgman India Pvt.Ltd	1975	Indian	Large	Design and manufacture of mechanical seals and sealing systems for a wide array of equipment that include pumps, compressors, mixers, kneaders, agitators, turbines, etc.	Automotive and automotive components
Maharashtra, Mumbai	Uhde India Ltd	1977	Indian	Large	Manufacture of machines for chemical production	Other
Maharashtra, Mumbai	Emco Precima Engineering Pvt.Ltd	1994	Indian	Small	Marine electro-magnet. brakes and soft starters for all marine applications	Automotive and automotive components
Maharashtra, Mumbai	Kimo Electronics Pvt.Ltd	1999	Indian	Small	Motor soft starters, drive panels, etc.	Automotive and automotive components
Maharashtra, Mumbai	Evonik India Pvt.Ltd	2003	Indian	Small	Engineering consultancy services, operation and maintainance service, IT solutions for the power sector, training and advisory services	IT
Maharashtra, Mumbai	Connect Chemicals India Pvt.Ltd		Indian	Small	Import and export of water treatment chemicals, biocides, thermal and carbonless paper chemicals etc	Chemicals
Maharashtra, Mumbai	Schuetz & Co. (India) Pvt.Ltd		Joint Venture	Small	Manufacturers and exporters of active pharmaceutical ingredients (APIs) and their intermediates	Chemicals
Chennai, Tamil Nadu	Siemens Ltd.		German	Large	Engineering	Electronics
Chennai, Tamil Nadu	SMR Automotive Systems India Ltd.		Indian	Large	Polymer processing, manufacturing of electro-mechanical systems	Electro-mechanical
Chennai, Tamil Nadu	JBM Auto Systems Pvt. Ltd.		Indian	Large	Manufacturing frames	Automotive and automotive components
Chennai, Tamil Nadu	Suspa Pneumatics India Pvt. Ltd.		German	Large	Manufacturing of gas springs	Chemicals

Employee Size (training staff in case of training centres)	In-House Training (Y/N)	Demand for Skill	Training Staff (No.)	Are you satisfied with current availability of skills ?	Deficiencies in Skill Devt and Training	Joint Funding (Y/N)	Inter-Industry Collaboration (Y/N)	Recommen-dations for Government
500 +	Yes			No	Teaching quality		It is possible. ACMA is picking up clusters and training	Curriculum
500 +	Yes	Yes		No	Teaching quality		It is possible. ACMA is picking up clusters and training	Curriculum
4500	Yes			No	Curriculum	No	Yes	Industry participation
422	Yes	No	25	Yes	Curriculum	Yes	Yes	No
110	No			No	Industry exposure	No	No	Industry participation
95.000	Yes	Yes, Computer science		No	Industry exposure	No	No	Curriculum
15000 +	Yes	Yes	They have a dedicated training programme.	No	Teaching quality	Yes	Yes	Regulatory structure
160–170	Yes			No	Link between theory and practice		Yes	Curriculum
	Yes			No	Curriculum	Yes	Yes	Industry participation
10.000	Yes	No	No	No	Link between theory and practice	Management will decide	Yes	Curriculum
1000	Yes	No	No	Yes	No	Yes	No	No
1.100	Yes	No	No	No	Curriculum	Yes	No	Curriculum
14	No	No	No	Yes	Industry exposure	No	No	Curriculum
11	No	No		Yes	No	No	No	No
100	No	No	No	Yes	No	No	No	Curriculum
9	No	No	No	Yes	No	No	No	No
	No	No		Yes	No	No	No	No
330	Yes		No	No	Curriculum	Yes	No	Curriculum
350	Yes	Yes	No	No	Link between theory and practice	No	No	Curriculum
1700	Yes	No	5	No	Link between theory and practice	No	Yes	Curriculum
350	Yes	No	No	No	Curriculum	Yes	Yes	Industry participation

State, Region	Company	Year of establishment	German, Indian, Joint Venture	Large, Small & Medium	Products	Sector
Chennai, Tamil Nadu	Magnetic Auto Control Pvt. Ltd.		Joint Venture	small	Vehicle access control automation	Automotive and automotive components
Chennai, Tamil Nadu	Witzenmann India Pvt. Ltd.		German	small	Manufacturing of industrial and automotive products	Automotive and automotive components
Chennai, Tamil Nadu	Henkel Teroson India Ltd.		Joint Venture	Large	Manufacturers of Adhesives	Chemicals
Chennai, Tamil Nadu	Heidenhain Optics & Electronics India Pvt. Ltd	2008	German	small	Manufacturers in machine tool	Automotive and automotive components
Chennai, Tamil Nadu	Harita Fehrer Ltd.		Joint Venture	Large	Solution provider of seats and seating systems	Automotive and automotive components
Chennai, Tamil Nadu	OBO Betterman India Pvt. Ltd.	2008	Joint Venture	small	Assembling electrical and infrastructure components	Electricals
Pune, Maharashtra	Lumax Industries Ltd.	2006	Indian	Large		Electricals
Pune, Maharashtra	Minda Staneridge Instruments Ltd.	1994	Others	Large		Electronics
Pune, Maharashtra	Yazaki India Ltd.	1997	Others	Large		Electricals
Pune, Maharashtra	Dali & Samir Engineering Pvt Ltd.	1972	Indian	Small		Automotive and automotive components
Pune, Maharashtra	Ranook Autocomponents Pvt. Ltd.	2003	Indian	Large		Automotive and automotive components
Pune, Maharashtra	Mercedes-Benz India Pvt. Ltd.	1994	German	Large		Automotive and automotive components
Pune, Maharashtra	Behr India Ltd.		Joint Venture	Large		Automotive and automotive components
Pune, Maharashtra	Kirolskar Brothers Ltd.		Indian	Large		Automotive and automotive components
Pune, Maharashtra	General Motors India Pv. Ltd.		Others	Large		Automotive and automotive components
Pune, Maharashtra	Tata Motors		Indian	Large		Automotive and automotive components
Pune, Maharashtra	Knorr-Bremsc, Survey no.278	2005	German	Large		Automotive and automotive components
Pune, Maharashtra	Shriniwas Engineering Autocomponents Pvt. Ltd.	2007	Indian	Large		Automotive and automotive components
Pune, Maharashtra	Tata Toyo Radiator Ltd.	1998	Others	Large		Automotive and automotive components
Pune, Maharashtra	Bharat Force Ltd.		Indian	Large		Automotive and automotive components
Pune, Maharashtra	Galenlel India Ltd.		Indian	Large		Automotive and automotive components
Udhyog Vihar, NCR	Magnetec Mangal Pvt Ltd		Indian	Small		Electricals

Employee Size (training staff in case of training centres)	In-House Training (Y/N)	Demand for Skill	Training Staff (No.)	Are you satisfied with current availability of skills ?	Deficiencies in Skill Devt and Training	Joint Funding (Y/N)	Inter-Industry Collaboration (Y/N)	Recommen-dations for Government
21	No	Yes	No	No	Link between theory and practice	No	Yes	Curriculum
50	Yes	Yes		No	Curriculum	Yes	No	Regulatory structure
110	Yes	Yes		No	Curriculum	Yes	Yes	Curriculum
18	Yes			No	Industry exposure	Yes	Yes	Industry participation
330	Yes		1	No	Link between theory and practice	Yes	No	Industry participation
62	Yes	No	Nil	No	Industry exposure	Yes	Yes	Industry participation
506	No	No	No	No	Link between theory and practice	No	Yes	Regulatory structure
1200	Yes	No	3	No	Link between theory and practice	Yes	Yes	Governance structure
3000	Yes	Yes, Electrical	No	No	Industry exposure	Yes	Yes	Curriculum
95	No	No	No	No	Link between theory and practice	No	Yes	Governance structure
200	No	No	No	No	Link between theory and practice	No	No	Governance structure
10000	Yes	Yes, Mech, Electronic	10	No	Link between theory and practice	Yes	Yes, joint training programmes, setting up training centre	Curriculum
1000	Yes	No	2	No	Link between theory and practice	Yes	Yes	Regulatory structure
300	Yes	No	No	No	Link between theory and practice	Yes	Yes, common training centre, certification	No
470	Yes	No	8	No	Link between theory and practice	Yes	Yes, term a basic training centre, certification	Governance structure
5400	Yes	Yes, CNC automation	34	No	Link between theory and practice	Yes	Yes, we will, cluster training certification	Regulatory structure
210	No	Yes, Automation	No	No	Link between theory and practice	No	Not possible	Curriculum
500	No	No	No	No	Link between theory and practice	No	Yes	Curriculum
1400	Yes	No	4	No	Link between theory and practice	Yes	Yes, sector skill unial others way of doing	Regulatory structure
4171	Yes	No	8	No	Link between theory and practice	Yes	Yes, more co-operation between companies	Industry participation
6000	Yes	Yes, Automati-on, Mechanic	15	No	Link between theory and practice	Yes	No	Regulatory structure
90	No		No	No	Curriculum	Yes	Yes	Industry participation

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