Vocational Education and Training Reform in India

Business Needs in India and Lessons to be Learned from Germany

Santosh Mehrotra, Ravi Raman, Neha Kumra, Kalaiyarasan, Daniela Röß

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 consisted of Dr. Ravi Raman, Kalaiyarasan, Neha Kumra (IAMR) and Daniela Röß from Bertelsmann Stiftung. They were assisted in the primary survey by Dr. P. K. Saxena, Dr. Kamala Devi, S. K. Yadav and Vijay K. Saxena.
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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. Moreover, Vocational Education carried out in secondary schools (since the mid-1980s) has received very limited funding in recent times; it has remained non-aspirational, of poor quality and involves little industry collaboration. In contrast, the Vocational Education and Training (VET) system in Germany is characterized by much higher proportion of youth participation, intensity of private sector participation and a basis in legislation.

In this context, this study seeks to understand the experience of Germany's Dual System of education and training as it has been historically cited as a successful model, and is one reason for the competitiveness of Germany's manufacturing sector. The study involved a primary survey of 44 firms, mostly large, all in the organized sector, and most in manufacturing. It attempted to identify the skills gaps experienced by German, Indian and joint-venture firms in India. The study asserts the need to restructure and re-orient the Indian Technical Vocational Education and Training (TVET) system to address current and prospective challenges by taking on board major social partners: the corporate sector, the state and students/parents.

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Executive Summary

The present study on the issue of reforms to Indian Vocational Education and Training (VET) has been undertaken at a time when the country faces both opportunities and challenges in India's growth story. While the opportunities are in terms of a demographic dividend, the challenges are posed by persistent skills gaps: barely 2 per cent of the Indian workforce has formally acquired skills and another 2.4 per cent of workers have some technical education. The Indian government has set a target to skill 500 million people by 2022. In another estimate, the number of people to be skilled by 2022 is 291 million if India wants to become a leading manufacturing economy in the world (Mehrotra et al 2013).

A drastic restructuring of Indian VET has been suggested as one of the key routes by which the persisting skills gaps could be plugged and inclusive growth could be pursued in the midst of demographic and structural economic transformation. The study engages with this question by offering 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 Indian labor market requirements and skills needs 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, automobiles, electrical and electronics, and IT) in India; 2) to examine the replicability of some elements of the German dual system in the Indian context; and 3) to develop workable recommendations regarding the areas in which the Indian system of skills development could be enhanced.

Findings from the primary survey

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

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

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

c) Frequently cited deficiency in the current system of Vocational Education and Training (VET) were, first, that there was a lack of linkage between theory and practice that needs to be resolved, and, second, that there was a lack of qualified trainers.

d) To meet the skills gaps, companies resort to technological changes, i.e. replacing labor with new machines.

e) Companies have expressed interest in working with other companies on skills development and basic training. In particular small firms expressed interest in cluster-based training. Some of the companies expressed reservations with regard to joint funding models as firms were unwilling to share their proprietary knowledge.

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

g) Several enterprises suggested that changes to the Apprenticeship Act which regulates the training of apprentices in industry are required in order to make the remuneration and duration of training more flexible. It is often argued that the Act is largely aimed at addressing the legal requirements and obligations set down by the Act itself rather than the actual improvement of skills.

h) This is in addition to problems such as a lack of single windows for private companies to appoint trade apprentices, lack of awareness of apprenticeship schemes, outdated curricula and cost of training.

Lessons of the German dual system and recommendations for India

Lessons can be learned from the German model which could help to overcome the challenges India is facing. Three main elements of the German model are interesting for the Indian context.

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

b) An integrated approach to VET operates in Germany, in which various stakeholders are actively involved as social partners (private companies, the state, trade unions, employers' associations etc.) in designing curricula, codifying skills and fixing standards. This approach of public private partnerships (PPP) is desirable for India where the contribution of the private sector to curriculum building is almost non-existent and certification is governed solely by the Ministry of Human Resource Development. Industries and their associations should be encouraged to help update teaching materials, practical training and occupational standards in light of their skills needs. A new governance structure could be introduced by passing a

comprehensive Vocational Education and Training Act – broadly similar to that in place in Germany (Berufsbildungsgesetz, BBiG) – which would make the VET system more organic and integral 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 met by the private sector in Germany, the 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 the Indian case. One way to solve this issue is to establish a National Training Fund in India through which private actors contribute.

Recommendations which go beyond these elements of the German model of vocational education

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

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

b) Small firms can develop cluster-based training approaches to solve 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' organizations or private firms could be one way to enhance public private cooperation.

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

Chapter 1

Introduction

Human resource paradox

India's demographic window offers both opportunities and challenges. From the perspective of the opportunities coming up, India is set to become one of the youngest nations in the world by 2020. It is further strengthened by the fact that the average working Indian will be only 29 years by 2020 as against 37 in China and the US, 45 in Europe and 48 in Japan (Economic Survey 2011-12, Government of India), thus clearly indicating how India will have 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 null and void. The larger structural transformation of the Indian economy has triggered an outflow of rural workers from 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 against a low skill availability of the workforce. Currently, it is as low as 5 per cent if vocational education and other forms of technical education are taken together, compared with more than 60 per cent in many other countries (see Planning Commission 2008; FICCI 2012). The challenge is further strengthened in light of the fact that it is specifically in employment creating sectors such as manufacturing, software and automobiles that the firm-skill incompatibility is most severe.

Persisting skills gaps

Persisting skills gaps in 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 2 per cent of the Indian workforce has skills training in formal vocational education and 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 a dynamic change. According to National Policy on Skills Development 2009, it is expected that over the next 15 years, 365 million people will be eligible to join the workforce and about 11–13 million people are expected to look for employment opportunities each year. Sensing this urgency, the 12th five year plan positions the 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 the public discussions. Studies on the quality of skills and 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 and conservative courses, failure to upgrade modules, failure to respond to market signals and the consequent lack of functional skills (IAMR, 2011).

Lessons from Germany?

It is in this context that the study seeks, first, to understand the experience of German dual system as it has been historically been cited as a successful model of education and training (Euler 2013) and a reason for low youth unemployment and, second, to identify practical solutions to 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 taking on board the major social partners: the corporate sector, the state and students/parents. It is argued that by adopting some of the critical elements of the German dual system, the Indian VET could be strengthened, which in turn would fortify the Indian economy. The study will explain the differences between the German and Indian systems, what the key factors are in the German case and how these could be adopted to make a blue print 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, automobiles, 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 11 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 for the Indian context. Three elements will be discussed in detail and recommendations will be provided on how an effective Indian model in terms of skill enhancement, joint funding, and curriculum design and work-effectiveness could be developed and advanced.

Third, it indicates recommendations for the improvement of the Indian VET system with the objective of minimizing 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 the common running element being the recognition of two aspects:

(1) that there is a shortage of required skills in the respective sectors and
(2) that they still manage to run their business activities with their own way of making trained workers available. This could be either through in-house training as it has been in the case of large firms or through finding alternative ways of training in the case of small and medium firms.

Company sample

Forty-three (43) firms were surveyed, of which 12 were German companies, 7 were joint ventures, 20 were Indian companies and the rest (4) were joint companies with other countries. Thirty-two (32) of the 43 enterprises 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 firms in each sector made available to us by the Indo-German Chamber of Commerce, New Delhi and Bertelsmann Stiftung, Germany. In the process of selecting the firms, we factored in the sectorial composition of firms and adequate representation by state. In order to compare and contrast Indian and German firms, we included an additional sample of Indian companies. Through specific questions, we sought to ascertain firm satisfaction with the availability of skills, the in-house training provided, firms' expectations of the state with regards to meeting skills gaps and the mechanism for potential collaboration.

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

Outline of the survey research questions

Research questions

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

- What are the current requirements and availability of different skills in the main business sectors in which German firms 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 with the program?

- What exactly are the hurdles faced by German companies and Indian companies in India in terms of the supply of skills required and firm-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 and what role could each of the stakeholders involved play?

Organization of the report

The Report is divided into five chapters. Following the introductory chapter, Chapter 2 discusses the demand for skills among Indian and German firms 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 and the "supply" of the current VET system in India and the lessons for the Indian VET system to identify what changes are necessary in the Indian VET system. This is largely based on our field survey. In Chapter 3, the VET system in Germany is analyzed followed by Euler's approach to dividing the dual system into 11 elements. Closely related issues such as the dual principle, public private partnerships and joint funding are elaborated upon. Chapter 4 discusses the Indian VET system with its strengths and weaknesses and highlights 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 provide reform recommendations for the improvement of the Indian VET system in such a way that in the short run and long run, the skills requirements of these industries could be met 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 requirements are increasing continually at two levels: making new job seekers entering the labor 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 engage with the same question in this chapter as well as with a view to linking up the skills demands of German and Indian firms operating in India. This is based on our field survey of four sectors: automotives, 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 our estimate of projected skills gaps 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 firms under study 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) program as experienced by industry (Section 4). In Section 5, the ways in which the firms 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 firms to organize cluster-based training is discussed. Finally, we explore the willingness of firms 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 totally illiterate or with primary/less than primary education. In 2009-10, out of the total workforce of 460.2 million, those who had a secondary education numbered 50.8 million, those with formal Vocational Training 7.9 million and those with Technical Education[1] 10.5 million. As seen in Table 1 228.2 million people of the workforce were either totally illiterate or with 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 those in 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 standard)	103.2	24.53
Middle (6th to 8th standard)	74.1	17.61
Secondary (9th to 10th)	50.8	12.07
Higher secondary and above (diploma/certificate/ graduate/postgraduate) (11th 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 is that half of the current work force (about 228 million) which is either illiterate or only has completed primary education or less (likely to be functionally illiterate except for the ability to write their name), must be ensured 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 the number of workers entering the workforce each year in India would be 2 million and the projected labor force at 2022 would be around 580 million. Of this, nearly 291 million or around half of the work force will need to be skilled by 2022.

Table 2: Numbers to be Skilled by Education Level in 2022 (Millions)

Formal vocational training	136	24.53
Vocational training for those informally trained	55	17.61
General education higher secondary & beyond	100	12.07
Total	291	16.04

Source: Mehrotra et al, 2013

2.2 Demographic and Structural Transformation in India

Declining trend of increase

With the fact that the current growth rate of the population is 1.6 per cent per annum and the Total Fertility Rate falling towards the replacement rate of 2.6 (IAMR 2011), what is likely to happen is that the workforce to be skilled would increase but at a declining trend. The new entrants into the labor 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, in terms of the structural transformation of the economy. As has been highlighted by Mehrotra et al (2013), there has been an outflow of labor from the agriculture sector mostly to 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. It consists of 10 high-growth job creating sectors (manufacturing, textiles, construction, automotive, health care etc.).

2.3 Survey Results

Company samples

It must be noted here that our survey is a slice of the organized sector firms. Organized sector contribution to total employment in manufacturing is just about 15 percent while its contribution to total output is about 78 percent (Mehrotra et al 2012). Therefore one has to take this fact into account before prescribing any policy recommendations based on the field survey. As shown in the tables below about 43 firms were surveyed, of which 12 were German companies, 7 were joint ventures, 20 were Indian companies and 4 were joint companies with other countries. In terms of sectors, 38 companies were in manufacturing, while five of them were in services (see table 3 below). Similarly, out of 38 total manufacturing firms surveyed, 22 were from auto and auto-related firms which accounted for the largest share in the sample (see Table 4 below). Nine were from Electrical and Electronics while about five firms were from chemical sector. If we look at the distribution of firms in terms of nature of products (capital goods, intermediate goods and consumer durables etc.), we find that most of the firms (35) are in the intermediate sector, following an equal distribution of firms in capital goods and consumer durables. Many of the firms belonging to the intermediate sector are suppliers of electronics, brake systems, chemicals, ICT and manufacturer of machine tools. Case studies of the firms with state-of-the-art in-house training are analyzed with the expectation that other firms could emulate such practices.

Table 3: Distribution of Firms 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 Firms 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	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 firms out of 43). The skills-related problems are twofold: quantity and quality. The companies that are smaller in size are facing shortages of skilled personnel. Small firms generally face competition for low-end skills such as 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, beginning with the question of the division between theory and practice (see Figure 1 below).

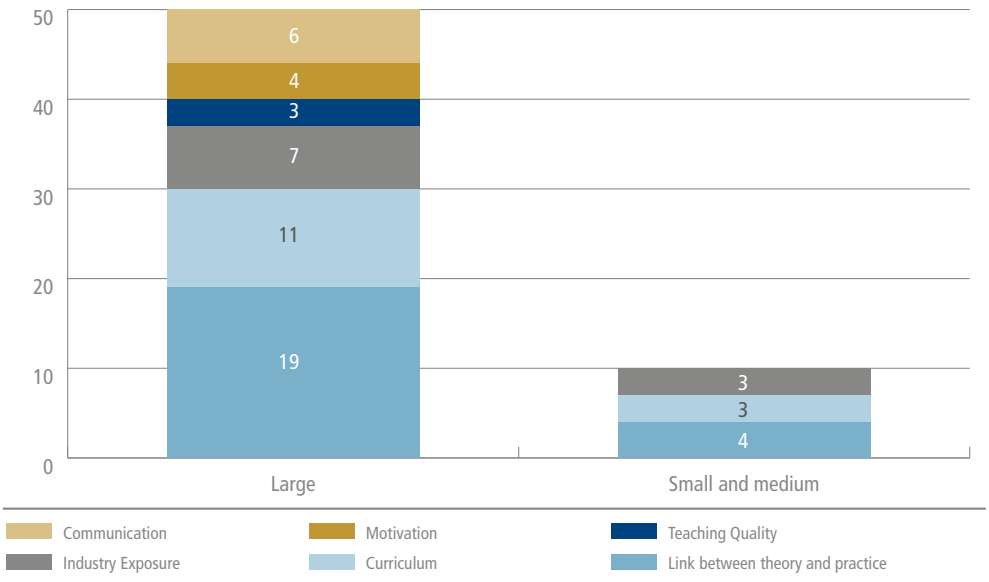
Table 5: Deficiencies in Skills Development as Cited by Large and Small Firms

	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, which includes New Delhi, as well as urban areas surrounding it in neighboring states of Haryana, Uttar Pradesh and Rajasthan.

Figure 1: Deficiencies in Skill Development as Cited by Large and Small Firms



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 pass out from Industrial Training Institutes (ITIs) and Polytechnics lack application-oriented knowledge and problem-solving skills, and some cited a lack of industrial exposure among students. The companies were almost unanimous in affirming that they need to train the new recruits with on-the-job training to make them employable. This is a major shortcoming of the way in which VET is organized and governed in India. Therefore, both micro and macro studies show that not only the percentage of workforce having formal vocational training and technical education is low, the quality of those trained is also far short of industrial skills needs. For instance, Suspa Pneumatics India Pvt Ltd, which specializes in manufacturing gas spring 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 the sufficient number of candidates but as Nettur Technical Training Foundation (NTTF)[3] has rightly pointed out in the 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 in labs and on worksites. In addition, as has been raised in the discussions organized by the Bertelsmann Stiftung in Bangalore, in Indian vocational education, "the orientation towards application is missing". Up-to-date theoretical training in schools has to

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

be combined with 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 same 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. To quote him again, he 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, it is worth mentioning the case of Bosch Vocational Centre (BVC) in Bangalore which draws on the German dual model. Bosch has training centers in Pune, Jaipur, and outskirts of Bangalore. The student employees are paid a stipend of Rs. 3-4,000 during apprenticeship and 30-40% students are from Scheduled Castes/Scheduled Tribes/Other Backward Communities; most of the students are supporting families. Students at Bosch are trained after 10th grade for three years under the Apprenticeship Training Scheme. Students are selected on the basis of marks, written test, and interviews. The curriculum at BVC is customized to Indian requirements and is the culmination of systems expertise and infrastructure. Within the ITI/Craftsman Training Scheme industry exposure is limited, whereas students at BVC are engaged with industry (see Box 1 below on Bosch Vocational Centre). Further, NTTF mentions that "Bosch Vocational Centre can be treated as role model...people should realize the importance of dual system... we are ready to tie up with BVC, Siemens..." confirms NTTF.

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 Bosch Vocational Centre (BVC) was established in 1960. BVC was conceived and set up as a fully-fledged training center to develop a reservoir of skilled personnel required to produce quality products using sophisticated machines. It is notable that the establishment of BVC preceded the enactment of the Apprentices Act. In fact, the committee responsible for the formulation of the Act visited Bosch Ltd and found that BVC was a working model for them to study. Bosch's views were sought on the draft memorandum of the Act and since then BVC has been the center to cater to all training needs of the company.

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 the Secondary School Level Certificate (SSLC) level in two batches each year, and graduate apprentices hip training which takes 30 engineering graduates

in Mechanical, Electrical, Electronics, Mechatronics, Automobile, Industrial Engineering & Management and Industrial Production & Engineering streams, each year. In addition, the scheme of project trainees in Bosch Ltd was started in 1995 as a social obligation to strengthen the industry-institute relationship. In this scheme, final-year engineering students from various colleges are allowed to carry out their project activities to fulfill their academic requirements and also to gain experience in an industrial working environment.

Source: Information Booklet, Bosch Vocational Centre, Bangalore

Most of the firms 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 industry and government is possible and that employers' associations have a role to play. In addition, 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 center. Even a single training room is considered in-house training.

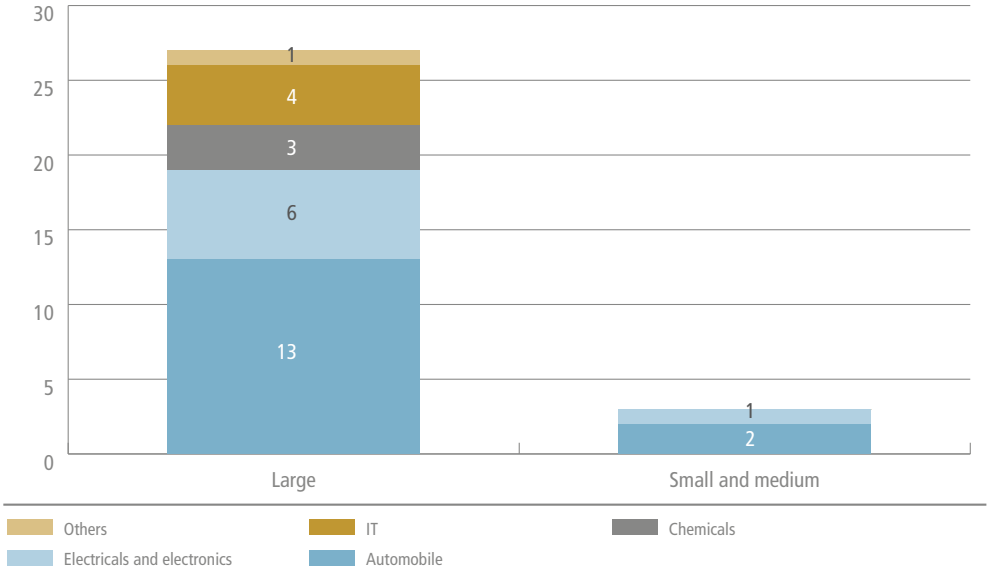
Small and large companies

The size of the companies was determined according to the number of employees on the payroll; those employing less than 100 workers designated as small, and those with over 100 employees were designated as large. For the small firms, the number of employees varies from 9 to 100 and for the large firms, it varies from 110 to as high as 100,000. Half of the firms employing 110-1000 workers are in the auto and auto components sector, and 15 firms provide employment within the range of 110 to 100,000 of which 8 are in auto and auto components sector. With respect to the IT sector, 4 firms out of the 5 surveyed employ workers within the range of 1000-100,000. It is clear from the survey that the large companies have to resort to some form of in house training to maintain productivity and competitiveness. Small companies repeatedly said that they cannot afford to have their own training center and most of them are facing a shortage of skilled workers. Often shortages of skills and skilled workers result in higher wages than the competitive equilibrium wage.

Training facilities

Within the 30 companies reporting facilities for in-house training, 27 are large companies (employing more than 100 workers) and the rest (3) small and medium (see Figure 2 below). Out of 22 companies interviewed in the automobile sector, 15 had in-house training centers. Within the 9 companies in the electrical and electronic sector, 7 had some form of training facilities. The remaining 8 which had training facilities are in chemical and IT sectors

Figure 2: In-house Training by Sector and Employment Size of Firms



Note: Total firms 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 firms

Of the 22 firms interviewed in Bangalore and Chennai, 11 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 firms. Larger firms have fully equipped training centers, while smaller ones give functional and workable training to newcomers based on their immediate skills needs. Investment in training is made where firms are assured of a return from the training and are confident that they could retain trained workers. A comprehensive training program that caters to both the potential employees and external candidates and faculty (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 employees 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 and in terms of social responsibility, it boosts the morale of the firm while projecting a favorable public image of the company. In this context, no other foundation program is as vast and well integrated in the world as that of the Infosys Global Education Centre (GEC). The residential training program 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 programs by talented trainers. About half of the teachers are trainers with technical and non-technical expertise. The training program 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 organizations.

Over 100,000 entry-level engineers have so far been trained here, and it 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 over 50 offices across the world. Infosysians, as they are known, are responsible for designing and delivering IT-enabled business solutions to the global clients. 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 quality students to meet the growing demands of the industry", Infosys launched Campus Connect in 2004, a first-of-its-kind industry-academia interaction program. Campus Connect aims to be a partnership forum where the best practices at Infosys are shared with institutions. As on date 60 engineering colleges all over India have taken part in this program with more than 275,589 students and 9814 faculty members have benefited by this aligning process between engineering talents and the requirements of the industry. The Campus Connect also conducts Faculty Enablement Programs to train the partner college faculty on Foundation Program course delivery and industry oriented courses. Both the GEC and the Campus Connect are testimonies of 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 programs and business activities. While trainees from India find GEC no less than a home, special program 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 which includes 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 firm is also insulated from attrition, a common concern among other firms.

Source: Infosys Technologies Ltd, www.infosys.com

2.6 Small Firm Options: Cluster Training

Skill needs of smaller firms

Smaller firms express interest in cluster training for skill needs in specific industry. They expect government to play an active role in co-ordination or building nodal agencies to impart training. Firms expect the security of return on the investment they make in training. Some firms expressed the desire for government to guarantee such return by changing regulations or providing incentives to those firms which 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 for cooperation

It was mentioned in our survey that firms are unable to influence each other's decisions to engage in inter-firm collaborative project as that involves acceptance on part of the other company and a lot of investment. Firms expect government to co-ordinate among themselves and to contain the free rider problems: other firms will free-ride upon investment made by one firm in training or any of the state-run vocational schools as long as the free-rider does not bear financial cost. Firms also express difficulties in inter-industry cooperation in case of proprietary technologies as technology provides an edge in competition between firms. However, firms expressed willingness to be part of such cooperation in case of some generalized basic training (see Figure 3 below).

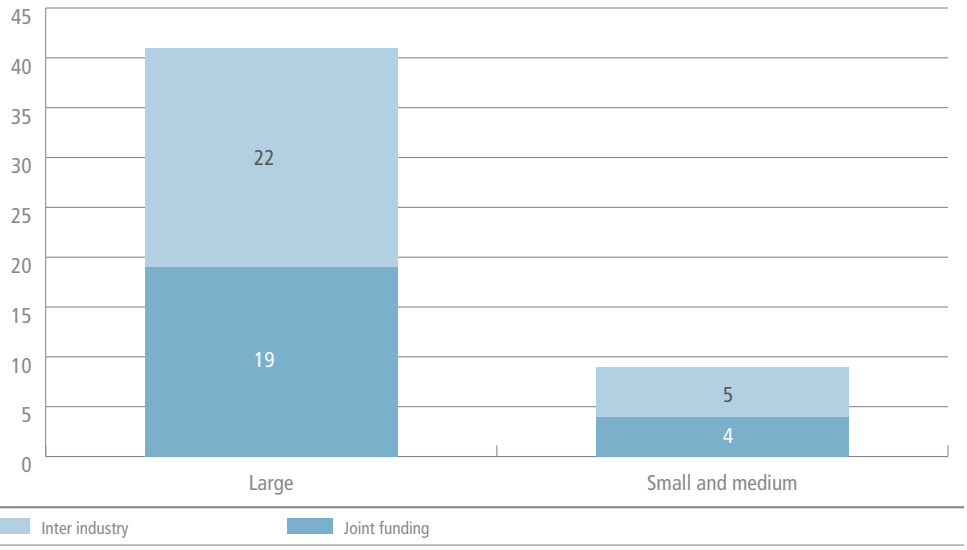
2.7 Joint Funding: Willingness to Collaborate

Joint funding schemes

Another significant finding is the willingness of companies to cooperate with others in skills development programs and joint funding with Government. About 19 large companies reported their willingness to earmark funds for skills development joint funding schemes while in the small scale sector, only three small companies expressed their interest in joint funding (see Figure 3 above). However, those firms that already have a training center have less interest in participating in joint funding. Some of them have international training arrangements as in the case of Wipro. 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 centers 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 programs (with Germany, the UK, etc.), small firms are deprived of 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 within its purview the training of the 10+2 vocational stream as "Technician (Vocational)" Apprentices; 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 cognizance 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 Firms 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, who states that training requirements are "client specific" runs three sets of training – developmental trainings on automotive components, leadership program 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 they also invite trainers from Philippines and Germany.

Deficiencies of ITI's

The representatives of Bosch are of the view that ITIs in India are not lacking funds but their infrastructure needs to be better maintained. The BVC has had experience with Memoranda of Understanding with ITIs where they took up a few ITIs and improvised them according to industry requirements, organized affiliation tours with government, and participated in fixing course curricula. Trainers in ITIs were given technical know-how, exposure to maintenance under a train-the-trainers program; Junior Technical Officers in government were trained in different skills (6-8 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. In their view, investment in training happens over a period of time, on the shop floor, in a few classes etc. Further, in certain sectors such as automotive, the amount of training investment could be higher, while in fitting no significant investment is involved and investment could involve around Rs. 50 million for 4-5 trades taken together. What is more important, according to them, are not the actual budget constraints but to quote, "the optimum use is the idea ..." Large firms like Tata

Motors and many members of Federation of Indian Chambers 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 Concluding Remarks

Shortage of skilled workforce

The micro-level field evidence from our survey in Bangalore, Chennai, Pune and Mumbai substantiates the macro picture of shortage of skilled workforce in India's labor market. The firms under study respond to this skills gap in two ways: they resort to on-the-job training for new recruits and some firms have in-house training programs on factory premises (though quality varies widely). With regard to the former, India clearly has the lowest level of in-firm training among the BRIC countries Brazil, Russia, India and China. However, our evidence suggests that as many as 30 firms of the 43 surveyed have in-house training of some description. While large companies have organized training schemes with huge investments, the smaller firms 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 labor market.

Assuring private participation

First, given the fact that there is a wide difference between theory and practice as explained by the firms, reforming the Indian VET has been of 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 on the ground.

Joint training programs

Second, private firms are interested in joint training programs, including joint investments in training, though some reservation was expressed by firms which are already running well organized training programs by some of the larger firms. Large Indian firms have adopted ITIs and invested in terms of infrastructure and training facilities. The Federation of Indian Chambers of Commerce and Industry (FICCI) members have already adopted several ITIs and have expressed an interest in taking over more of them which would help improve the Indian VET system in terms of infrastructure development and practice-oriented and industry-specific training programs.

Cluster-based programs

Third, small firms would do well to experiment with various forms of training schemes such as cluster-based programs. Industry associations rather than large employers' associations would be preferred. They also expect government to play an active role in coordinating or building nodal agencies to impart training. Firms expect the security of return on investment they make in training.

As companies invest in new techniques 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 for the Indian context. Given the fact that 'borrowed models' do pose their own problems we do not want to discuss replication of the German dual system as such but to identify the most useful aspects of the dual system which would be relevant for India and which could be successfully integrated into the Indian VET system. An entry point into the discussion is the Bertelsmann Study "Germany's vocational education system: a model for other countries" written by Professor Dieter Euler. The study identifies 11 core elements of the German dual system and discusses their potential for transfer.

In Section 1, we shortly discuss the German Vocational Education and Training system, Section 2 explains the 11 elements of the dual system as identified of the Bertelsmann 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

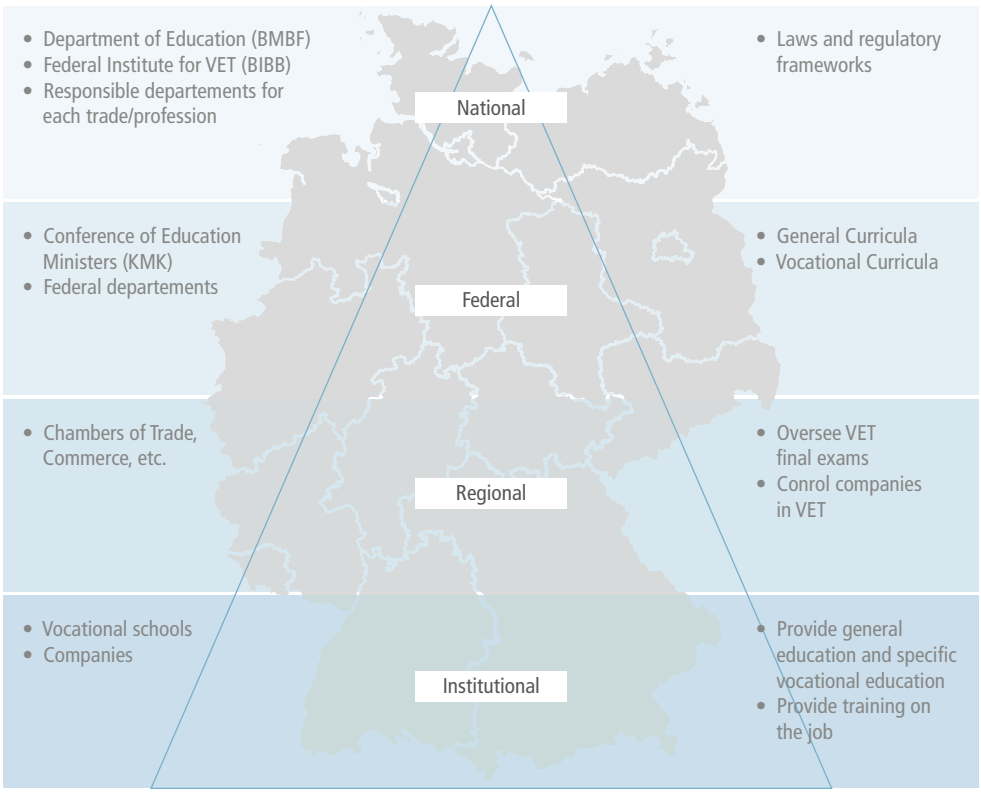
German VET system

Vocational Education in Germany is part of the national education system, and students commence training at the earliest after 9th grade of schooling. The courses last 2 to 3,5 years. The legal basis of the German VET system is the VET Act (BBiG) in 1969 which has been subsequently revised. In general, more than 50 percent in upper general education opt for such vocational training. The two major pillars of the dual system are the workplace within a company and the part-time vocational school. Learning at both venues is governed by distinct but coordinated regulations. The company provides practical training, and vocational school supplements this on-the-job learning with theoretical instruction. There are about 350 different occupations in technical, agricultural, commercial and industrial business. Also included are the public administration sector and health and social services. As a rule, the trainee spends eight to twelve hours per week at school; the remaining time is spent on the actual worksite. To become an apprentice in the dual system, a young person has to apply to a company for an apprenticeship and get a training contract. The right to attend the corresponding classes at the part-time vocational school follows automatically. Vocational course ends with an assessment held by the relevant competent authority. The latter include 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 recognizes training occupations by ordinance and issues training regulations. The states (Länder) are mainly responsible for curricula for the part-time vocational schools and funding of the teaching staff. Employers and unions draft proposals for training occupations and negotiate provisions in collective agreements concerning apprenticeships. The chambers supervise training in the company and training 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 (p19).

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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 labor market. So it is argued that the dual model helps in reducing the skills gaps and unemployment and promotes growth.

3.2 Introduction of Euler's Approach

Eleven core elements

In the Bertelsmann Stiftung study, Professor Euler (2013) identifies eleven essential elements in the German dual system and suggests ways to export those 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 such as 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 labor 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 the individuals concerned, the latter from social marginalization. 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 education 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 oriented to the labor market, it is 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 on the question of formulation of occupational profiles, conducting examinations, finding placements etc. all together working to raise the profile of VET and making it more acceptable to the public.

(5) Joint funding:

In Germany VET is a dual system which is managed and financed by the government and companies. E.g. in 2007, 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 firms, it also drives down the costs incurred by government.

(6) Complementary programs 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 programs that are run by schools or non-business entities in the event of a lack of company-based training positions.

(7) Codification of quality standards:

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 standardization 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 here as the interface between academia and policy makers to ensure centralized changes on improvement of 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 in the average there has been a fair degree of social acceptance.

3.3 Which Elements Are Important and Why

A model, not a blueprint

Not all of the above mentioned components are strictly replicable in other countries. The "modular approach" to transfer presented with these eleven elements implies that there is no ideal vocational education system but customized solutions which have to be adapted to the needs of a specific country. The present study identifies focuses on three 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 government and private sector play an active role. Third, the vocational training cost 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) makes a distinction between the "dual system" and "dual principle". The dual system refers to specific institutional regulatory set up and training sites which are needed to implement the dual principle, while dual principle means the way in which theory and practices are combined in the worksites. 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 - practical training combined with in-house training in companies - provides school children with in-depth knowledge about the job and process in 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-firm training among the other BRIC countries Brazil, Russia, and China. The share of firms that are currently providing in-house in-company training to their full-time permanent workers is only 15.9 per cent (World Bank, 2007). This share of Indian firms offering training is low as compared to other developing countries and there has been a decline in the percentage of firms offering in-firm training in the recent times. Given the low value perception of vocational education in India, the introduction of large-scale changes in the education system is a big task. However there have been attempts by the Indian government in this regard. Policy makers' increasing awareness of the issue has begun to promote an integrated approach to theory and practice among schools and worksites.

3.3.2 Vocational training as a task to be carried out in private-public partnership

Role of government and social partners

The regulatory framework of the dual system in Germany evolved over the time in response to the changes in economy and needs of the labor market. The core structure of the vocational training system is the constant 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 Länder (states) 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 localities. 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 their requirements. The whole system of VET is governed by a well-coordinated institutional legal mechanism. This has historically been so and was further strengthened by the VET Act (BBiG) in 1969 which has been subsequently 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 modernization of vocational training on the basis of technical, economic and social developments.

Apprenticeship Act in India

In India, there is neither constant alteration between vocational schools and companies nor is there a well working systematized 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 business

The most desirable element of the German dual system is the partnership between government and business 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 government in Germany contributes around 20 percent of the total costs of vocational training; the bulk of the cost, around 80 per cent is contributed by private entities. As practical training takes place on private work sites, it is also simultaneously a cost-sharing and curriculum-design mechanism. The private sector also contributes to codifying skills processes, standardization and curriculum design. Further, the private companies themselves have self-governing bodies (e.g. Chambers that cater to a single industry) which take care of organization, 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 a cost. 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 industrialization.

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 has been no move from the government to persuade the private companies to share the cost of training; nor has there been on the part of the private companies to work with each other in terms of cost sharing. Lately, there has been some development during the 11th Five Year Plan period in the form of Institutional Management Committees for government Industrial Training Institutes (ITI), on which both the local private industry is represented. However, as Mehrotra (2014 forthcoming) indicates, the experience with this PPP-model has been mixed.

3.4 Concluding 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 between theory and practice

First, Germany has both the dual system and applies the dual principle and it is organized in such a way that formal theoretical knowledge is provided in vocational schools run by the state, while practical knowledge is acquired on factory sites owned by private companies. The Indian VET lacks the kind of integration between theory and practice and hence requires a redesigning of its VET in such a way that there should be a theory-practice continuum among class rooms and worksites, approximating Euler's notion of the dual principle.

Institutionalized form of cooperation

Second, vocational education and training are based on a well-coordinated system where all relevant actors are involved. In India, such an institutionalized-legalized form of cooperation is missing. Curricula are developed solely by the government without any participation from 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 the financing of Vocational Education and Training. In the eyes of many companies, financing of training activates should be done be government alone. Funding of training activities is not seen as an investment, but as a cost. In the end, companies are the main beneficiaries of a skilled workforce 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' at home 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 experiences and work based learning. In Section 3, we address the question of how best to involve companies in the administration of the Indian VET-system and in the design of the curriculum for individual professions. Section 4 discusses how to involve companies in the funding of VET in India and how could cost-sharing between governments and business would work out and how companies could be motivated to accept cost sharing.

4.1 Vocational Eduction 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 standards. Outside the school system, vocational training takes place in institution-based training programs. In the latter, the period of training for various trades varies from six months to three years and entry qualification varies from 8th to 12th standard 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 for 3 years if begun in the 11th year, the vocational training lasts for 1-3 years depending on the chosen trade. The core responsibility of running the Vocational Education and Training in India lies with the Ministry of Human Development (MHRD) and the Ministry of Labor 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 not often well 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 standardization of syllabuses and 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 Labor and Employment (MoLE) regulates and monitors lower end of vocational educational training such as ITI through 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 program for those who pass out from ITIs and others through its Craftsmen Training Scheme (CTS)[7].

Training schemes

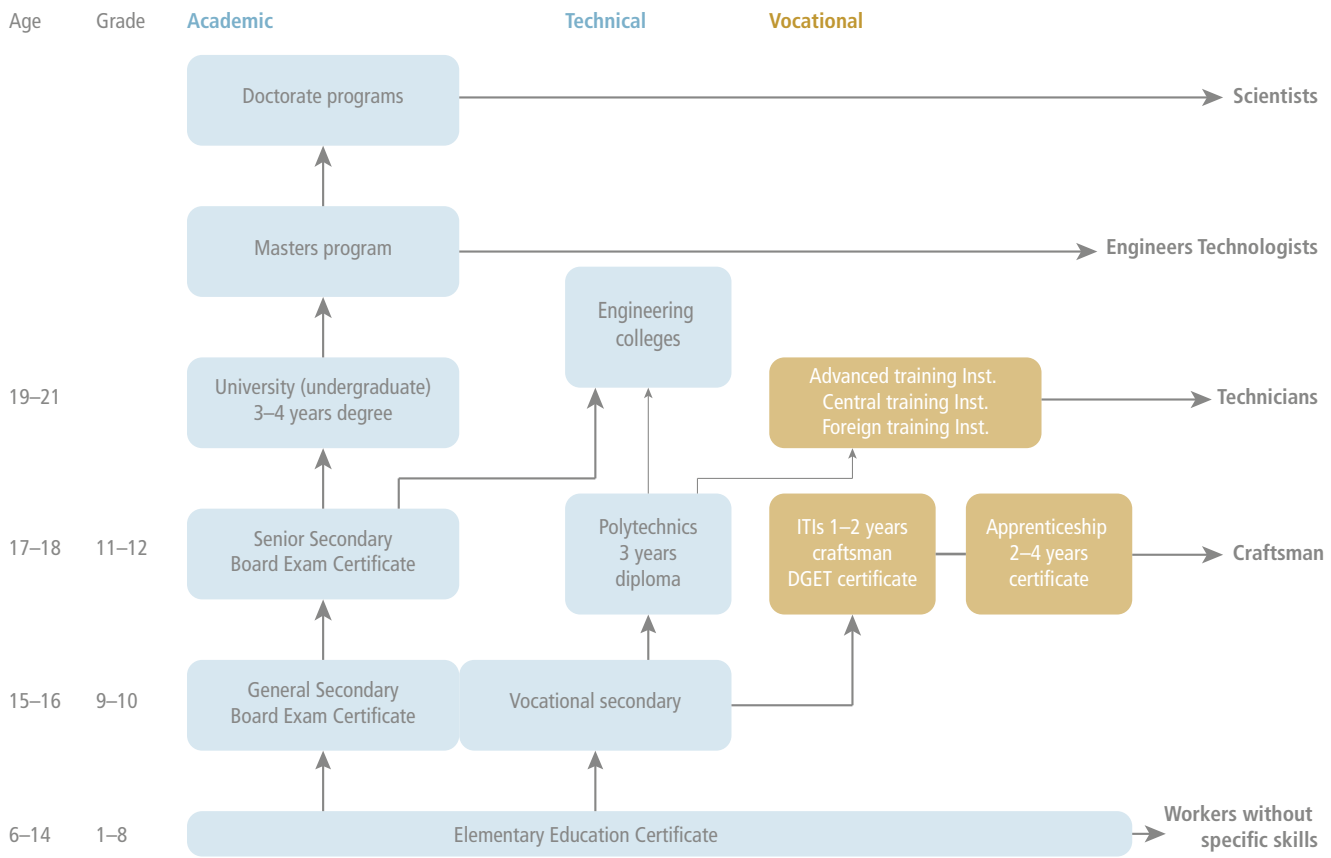
After successful apprentice training, the trainees are expected to appear before the All India Trade Test (AITT), the NCVT provides the certificates for those who pass out such exams. Another training scheme under the ministry is the Skills Development Initiative Scheme (SDIS). The scheme is targeted 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 scheme are provided certificates by NCVT. The relevance of either joint curriculum building or joint certification scheme with the involvement of various stakeholders has not so far been designed in the Indian context until recently.

National Skills Development Agency

A third component of the regulatory framework came to being with establishment of 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 harmonize the skill developments in the country and 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 and also provide self-employment opportunities to educated youth by giving them industrial training. The programs under CTS focus on industrial trades and are operated by ITIs, both the 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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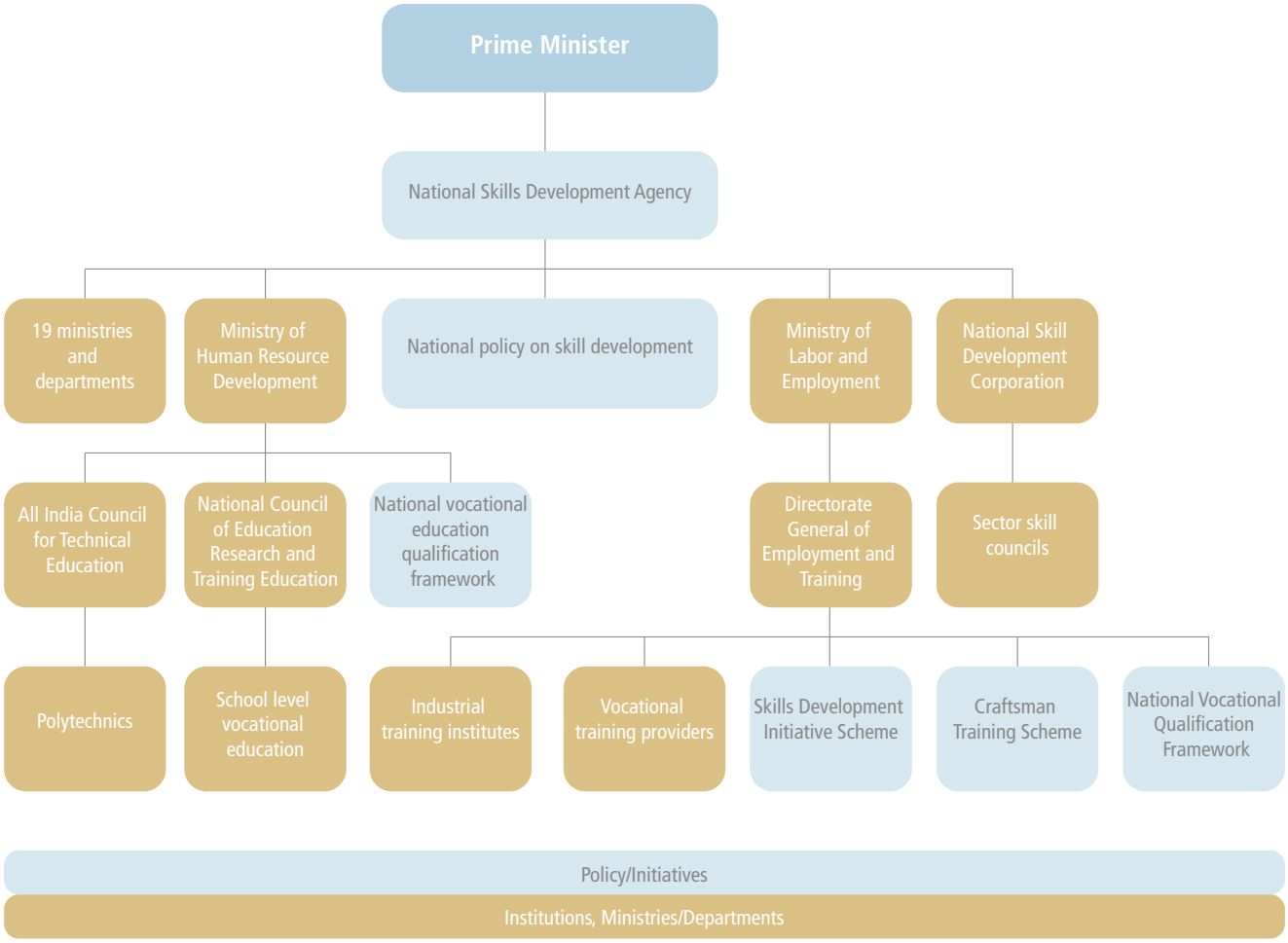
Figure 6: Technical and Vocational Education System in India



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 the maximum number of people in different trades in various enterprises under Apprenticeship Act 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 engaging apprentices (MoLE 2011-12). Currently apprenticeships are available in 252 trades (Mehrotra et al forthcoming). The main objectives of the Craftsman Training Scheme (CTS) are to provide skilled craftsmen to industries according to their requirements and also provide self-employment opportunities to educated youth by giving them industrial training. The programs under CTS focus on industrial trades and are operated by ITIs, both the public and private and the 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 meet 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 of 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 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:

(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,

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

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 pass outs 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 linkages with industry and understanding of employer needs. Hence, the training provided is based upon outdated perceptions of what is needed or on a centralized decision making process.

(3) Redundant and inadequate curricula and faculty: The curriculum has remained static over 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 pass-outs.

(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

To some extent there has been a successful attempt at linking theory and practice 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, and also private sector representatives. First, it is meant to proactively catalyze 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 organizations such as the European Union, International Labor Organization, the UK-India Education and Research Initiative and so on with the objective of introducing best practices in India.

International examples

On 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 the support from 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). Under 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 make theory-practice continuum in the Indian context, the central and state governments shoud be ready to give up their monopoly over the of designing modules and codifying skills. The participation of various stakholders is to be ensured in the administration of the Indian VET-System.

9 SSCs are employer led and state sponsored organizations 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 mode. 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 taking place 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 and 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 underpinning knowledge and understanding. This task is currently underway 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 do self-regulation. SSCs have to learn from them and adopt a method of regulating themselves towards the goal of preparing curriculum design, certification and standardization 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. Equally important is joint certification which in Germany was made possible through the Vocational Education and Training Act (BBiG) which enables joint certification of skills and competencies. This should strongly suggest 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 center on its premises and most of the workers are the product of this training center. It has a long tradition of investing in vocational training and capacity building in the country. For, instance, as of now, 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 curriculum as per needs of the industry and train 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 Auto Electrician. These courses were introduced to ensure uninterrupted flow of skilled workforce to its large scale network based dealers placed across India.

Training Center facility: The training center is designed on the model of ITI. It has about 23 qualified trainers coming from various disciplines. The center has fully equipped instruments and other infrastructure. Trainees are given a stipend of Rs 4500 per month. They are also given boarding and lodging facilities 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, their contribution to financing vocational training is next to none. The 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 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 as a Trust under the Indian Trusts Act was developed with an initial corpus of Rs 9951 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 adopt the existing ITIs by

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.

private the business community. The member industrialists 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 interests 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 Vocational Training Improvement Project with support of World Bank. Similarly about 1400 ITIs were upgraded under Public Private Partnership (PPP) mode (Policy Overview 2011), the performance of the same is yet to be reviewed.

International examples

As Mehrotra and Ghosh (2012) has 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 and South Africa has had it for at least 10 years. The proposal by Mehrotra and Ghosh (2012) to set up the National Training Fund could take one of several forms such as pre-employment training fund, Enterprise Training Fund, Equity Training Fund etc. which in turn depends on the active involvement of 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 organized and unorganized enterprises. It is the large and medium organized enterprises who would contribute the major share of the NTF but the unorganized sector will also need to benefit in the disbursal norms of the funds.

Training cost as an investment

Companies in India need to see training expenditure and the cost of sharing expenditure as an investment rather than a cost as in the case of Germany, China and Egypt. 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 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: The Sino-German Vocational Training Initiative

An initiative by German firms was the Sino-German Vocational Training project in 2011. The project was commissioned by Federal Ministry of Economic Cooperation and Development of Germany in collaboration with 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 percent of project cost.

4.5 Concluding 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 vocational education space 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 design, certification and the standardization of syllabuses. This provides the lesson to India of the need to pass a VET Act for joint certification as all certification has been done by 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 harmonize 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 under Public Private Partnership (PPP) mode with the intention of brining private sector initiatives in skill development. The NSDC has about 51% of its equity by private sector and 49% equity by the Government and the funds thus channeled to training are not in the form of grants but loans and equities and hence “re-circulating” which should be treated as perhaps 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 industries; small scale industries should also be allowed to access such funds.

Involving the private sector

The NSDC is expected to involve the private sector and create capacity for skills development in various sectors including the high growth sectors, through appropriate mechanisms with active support of private players including employer champers like FICCI and CII. It has identified 21 high-growth sectors and has plans to set up Sector Skills Councils (SSCs) for these sectors and for some sectors the SSCs have already been set up. SSCs are industry-led and supported bodies are expected to complement the existing vocational education system for the Industry Sector in meeting the skills needed in each sectors. 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

Concluding 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 industrialization, and the expanding size of informal sector(s) should also be taken into account when thinking about adopting the favorable 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 as in the case of Germany or China. The organized segment of Indian enterprises employing more than 10 workers accounts for 78 percent of all value-added in the non-agricultural sectors but they employ only 18 percent of all non-agricultural workers. On the other hand, the unorganized enterprises (which are very small in size) account for only 22 percent of value-added in output, but employ 82 percent of all non-agricultural workers. This fact makes the structure of Indian enterprise totally different in character from that of 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 firms that are in the organized 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 and found that German dual system by and large offers great insights for reforming the Indian VET. We have also found that India has already begun reforming its VET system, though it is too early to review its performance.

Lessons to be learned and recommendations

Assuring duality principle

In India, the practical component of vocational education and training is missing to a large extent. The duality principle should be made mandatory in India. The German model can provide a role

11 MHRD estimates that approximately 75 to 80 million jobs will be created in India over the next 5 years. 75% of these new jobs will require vocational training to enhance the employability prospects (MHRD 2011). Even if this 75 million estimate is over-optimistic, given that new non-agricultural jobs created between 2000 and 2012 has been on average only 7.5 million per annum, the fact remains that new jobs require skilled persons, while those already in the labor force also need access to VET.

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

Enhance public-private partnerships

Both the government and private companies should come to a consensus regarding the norms 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, as they are the major employers. Unless there is practical training at the work sites combined with class room 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 for setting common principles and guidelines for a nationally recognized 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 1000 VET schools. However, although the Auto Sector Skills Council (SSC) has been preparing National Occupation Standards, industry participation in the curriculum building is almost absent and this could only be assured if the SSC are activated across sectors with the support of the National Skill Development Corporation (NSDC). It is encouraging to see that in the auto sector, SSC has already been done and the Central Institute of Vocational Education Bhopal has developed the modules and standards; yet, industry participation in this sector also is also relatively inactive.

Develop a comprehensive VET Act

The regulatory system in Germany with the 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 of skills, 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: create 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). In the German construction sector, there is such a sectorial fund to which all companies must contribute, the resources of which are ploughed back into construction enterprises to enable them to provide training. At 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 percent of the training payroll levy on formal sector enterprises is sent directly to the NSF and 80 percent goes 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 and South Africa has had it for at least 10 years. Mehrotra and Ghosh (2012) have pointed out that the levy for NTF in India may start from the organized manufacturing sector since it accounts for about 78 % of output in total manufacturing. Large as well as small and medium sized companies should contribute to the fund. Given the fact that the organized sector accounts for only 15 per cent of the total manufacturing employment in the economy (Mehrotra et al, 2012), and the remaining is contributed by the informal sector, the authors have suggested the development of a policy framework to decide which of the firms are to be included in the levy framework depending on the turnover and the size of employment. Beneficiaries of the NTF should include both organized and unorganized enterprises. The training levy funds should also be used for financing students from poorer backgrounds as they are unable to bear the opportunity cost of undertaking training first before entering the labor 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.

Train 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. Even more serious is the problem that teachers themselves have had little or no practical industry experience, which is the opposite of the situation in Germany or China. Local industry must contribute for examples by offering trainers from industry to vocational schools and to introduce new courses relevant to the needs of local industry.

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

Cluster-based training is another possibility for the small firms to get a sufficient number of trained personnel. For instance, they could develop a cluster-based training approach where a few firms belonging to a particular locality can jointly generate training programs 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 form the first best alternative than the current practice of in- house training or competing for skills in the open labor 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 locally specific industry level decision making is that it is easy for firms 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, even though the local companies should take the lead in such institutional arrangements.

Involve employers association and large companies in upgrading training institutes

In certain sectors like engineering, the employers' association has taken particular interest in advancing training programs. The Federation of Indian Chambers of Commerce and Industry (FICCI), an industry wide federation of chambers, has adopted several Industrial Training Institutes and has expressed interests 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., and given the fact that they run efficiently and have wider acceptance, it is a policy which could be encouraged. What we would recommend in this context is that there should not be any discrimination between Indian and foreign firms, as the public good is accessible for all the firms. Large individual firms can also adopt ITIs. Tata Motors, for instance, has adopted nearly 137 ITIs in the country and 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 firms. The PPP model implicit in the above cases could be modified in a similar way that it should be embedded in the larger process of modernization of the economy.

Integrate skills training in the Companies Act

The Indian Companies Act (2013), as ratified by parliament, prescribes an expenditure of 2 per cent of profits on Corporate Social Responsibility activities in their respective areas of operation. Though the new regime would replace 57-year old Indian Companies Act, 1956 and usher in more transparency in the corporate bodies besides creating a new business environment for growth, the issues of either skill training or VET reforms are not adequately addressed. What would be desirable is to develop a "negotiated corporate social responsibility" (Raman 2010) and thereby neutralize 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 program 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 program "Germany and Asia" of Bertelsmann Stiftung focuses on India and China. It analyzes 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.

List of Companies (survey)

State, Region	Firm	Year of estab-lishment	German, Indian, Joint Venture	Large, Small & Medium	Products	Sector
Karnataka, Bangalore	Continental Auto-motive Components (Pvt) Ltd		German	Large	As a supplier of brake systems, systems and components for pow-ertrains and chassis, instrumentation, infotainment solutions, tires, and technical elastomers	Auto and auto components
Karnataka, Bangalore	Continental Auto-motive 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 counter-weight 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	Auto and auto components
Maharashtra, Mumbai	Eagle Burgman India Pvt.Ltd	1975	Indian	Large	Design and manufacture mechanical seals and sealing systems for a wide array of equipments that include pumps, compressors, mixers, kneaders, agitators, turbines, etc.	Auto and auto components
Maharashtra, Mumbai	Uhde India Ltd	1977	Indian	Large	Manufacture 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	Auto and auto components
Maharashtra, Mumbai	Kimo Electronics Pvt.Ltd	1999	Indian	Small	Motor soft starters, drive panels, etc.	Auto and auto 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-mecha-nical
Chennai, Tamil Nadu	JBM Auto Systems Pvt. Ltd.		Indian	Large	Manufacturing frames	Auto and auto 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 dedicted training program.	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	Firm	Year of estab-lishment	German, Indian, Joint Venture	Large, Small & Medium	Products	Sector
Chennai, Tamil Nadu	Magnetic Auto Control Pvt. Ltd.		Joint Venture	small	Vehicle access control automation	Auto and auto components
Chennai, Tamil Nadu	Witzenmann India Pvt. Ltd.		German	small	Manufacturing of industrial and auto products	Auto and auto 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	Auto and auto components
Chennai, Tamil Nadu	Harita Fehrer Ltd.		Joint Venture	Large	Solution provider of seats and seating systems	Auto and auto 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		Auto and auto components
Pune, Maharashtra	Ranook Autocompo-nents Pvt. Ltd.	2003	Indian	Large		Auto and auto components
Pune, Maharashtra	Mercedes-Benz India Pvt. Ltd.	1994	German	Large		Auto and auto components
Pune, Maharashtra	Behr India Ltd.		Joint Venture	Large		Auto and auto components
Pune, Maharashtra	Kirolskar Brothers Ltd.		Indian	Large		Auto and auto components
Pune, Maharashtra	General Motors India Pv. Ltd.		Others	Large		Auto and auto components
Pune, Maharashtra	Tata Motors		Indian	Large		Auto and auto components
Pune, Maharashtra	Knorr-Bremsc, Survey no.278	2005	German	Large		Auto and auto components
Pune, Maharashtra	Shriniwas Enginee-ring Autocompo-nents Pvt. Ltd.	2007	Indian	Large		Auto and auto components
Pune, Maharashtra	Tata Toyo Radiator Ltd.	1998	Others	Large		Auto and auto components
Pune, Maharashtra	Bharat Force Ltd.		Indian	Large		Auto and auto components
Pune, Maharashtra	Galenlel India Ltd.		Indian	Large		Auto and auto 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 trainning programs, 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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