

China's Skill Development System

Lessons for India

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The sustained rates of China's economic and industrial growth, along with the country's ability to become the world's factory, can be attributed, at least in part, to its educational reforms. China was able to realise the potential benefits of its demographic dividend by prudent reforms in technical, vocational education and training system. Policymakers in India are grappling with a similar set of constraints and it is crucial to undertake critical reforms in our skill development ecosystem to be able to realise the demographic dividend that is available till about 2040. The Chinese system, its major features, the periodic reforms undertaken, its financing, and the participation of industry, are discussed here. Further, the similarities and distinctions with the Indian system are highlighted along with key lessons from the Chinese experience.

The paper is based on the study commissioned by the Planning Commission and findings from interviews with officials, training institutes and industry in Beijing, Tianjin, Taiyuan and Chongqing were conducted by the authors on behalf of the National Institute of Labour Economics Research (NILERD, formerly Institute of Applied Manpower Research).

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Introduction

The People's Republic of China's achievement of becoming the manufacturing hub of the world is well known. The high industrial growth rates, averaging over 10% for the past so many years, stand testimony to this fact. The growth of agricultural output, rural industrialisation, and enterprise reforms since 1979–80 resulted in economic growth and rapid poverty reduction. The impressive growth performance in China can also be attributed to the successful structural transformation, both in terms of output and employment. The share of primary sector to total output declined from 28% in 1978 to 10% in 2011, while the share of the secondary sector remained at 47% (compared to 25% in India), and the share of the tertiary sector increased from 24% in 1978 to 43% in 2011. The share of employment in the primary sector decreased from 70% in 1978 to 35% in 2011, and the shares of secondary and tertiary sectors increased from 17% and 12% to 29% and 36%, respectively (Cheong and Wu 2013). When the economy grows rapidly, skill shortages often emerge. The need for skilled workers arising from this movement of workers out of agriculture to industry was addressed by the Chinese planners very carefully. The importance given to educational reforms, including vocational and technical education is evident in Chinese policy discourse. Guided by Confucian philosophy, Chinese society is best described by their quest of lifelong learning.

There are many features distinct to the Chinese economy that provided them with manoeuvrability and flexibility to implement skill development initiatives at the local level. Fiscal decentralisation in China holds special prominence and defines the flexibility at the local level for the government as well as for industry participation in their technical and vocational education and training (TVET) system (Mehrotra 2014). This is unlike the Indian system in which the content of most vocational courses is decided at the centre. The present paper discusses the Chinese technical and vocational education system highlighting the key reforms undertaken by them to address the skill development concerns of an emerging economy.

The rest of the paper is structured as follows. Section 1 describes the Chinese TVET system and the major points of distinction with the Indian system in terms of quality of education, teacher training, industry participation, role of local governments, and financing. Section 2 discusses the major skill development reforms undertaken by China—scholarships and making vocational education free; reforming the Vocational Education and Training (VET) Act, collaborations with industry

and newer ways of industry participation, etc. Section 3 examines the financing of China's TVET system. The last section concludes with an analysis of the lessons India can draw from the Chinese experience to better align vocational education and training with industry needs, in terms of financing, teacher training, and industry participation.

1 The Chinese TVET System

The Compulsory Education Law of 1986 resulted in near universalisation of the six years of primary and three years of junior secondary education. It also resulted in a growing demand for education post the junior secondary level. The Chinese TVET system has been comprehensively designed, taking into account the important aspects of vocational education and training—vocational education at the secondary level, in higher education institutes, vocational training in training centres, adult training and retraining, training of vocational trainers, financing as well as industry participation. Each of these sub-components will be subsequently discussed in this section. Vocational education in schools and higher institutions under the Ministry of Education (MOE) and vocational training post-schooling for pre-employment, on-the-job training, etc, under the Ministry of Human Resources and Social Security (MOHRSS) broadly define the institutional setting of the TVET system in China. This setting is quite similar to other countries, while what is interestingly different is the strategic role played by the local departments and industry (more on this later). While the ministries at the centre engage in strategic planning and policymaking, setting VET standards and curriculum development, the education and labour departments at the local level are responsible for daily administration including budget allocation and personnel management (Hao 2010).

Vocational Education in the School System: Chinese students are first exposed to vocational education at the junior-secondary level. The junior- or lower-secondary level comprising grades seventh–ninth are however now covered under the nine years of free compulsory education under the 1985 Act, after six years of primary education. Over the years the component of vocational education at the junior-secondary level is withering away. At the end of junior-secondary level, students have to take the senior high school entrance examination called the “Zhongkao.” This score determines the entry into general or vocational streams. Usually students with lower marks in the examination end up in the vocational secondary stream. While around 12% of junior school graduates joined the labour force, of the remaining 88%, 47% entered the vocational stream at secondary level in 2012 (IAMR 2014). This is in contrast with the Indian case, where only around 2.5% of those in the labour force receive (received + receiving) formal vocational education or training (Mehrotra, Gandhi and Sahoo 2013).

It is the vocational stream in higher secondary schools that cater to the vocational educational needs of the country. There were about 13,093 schools under vocational secondary education in China in 2011 (*China Statistical Yearbook* 2012). These schools are classified into four broad categories—regular specialised

schools, adult specialised schools and senior secondary vocational schools (under the MOE), and skilled workers or the technical schools (under the MOHRSS). While the specialised secondary, and secondary vocational schools (both under MOE) provide certificate courses for skilled and management personnel in the services sectors (for example, medicine and healthcare, finance and economics, commerce, information technology, politics and law, etc), the skilled workers schools (under MOHRSS) train workers with knowledge and skills required in the manufacturing and state occupational licensing qualifications (Hao 2012; Ding 2010). Table 1 highlights the different features of the four categories of schools.

Table 1: Some Attributes of the Vocational Education Institutes, by Level

Vocational Education Institutes	Number of Schools	Total Enrolment	Full-Time Teachers	Student-Teacher Ratio
Elementary level				
Vocational junior secondary schools	54	25,966	1,541	16.9
Secondary level				
Vocational secondary education	13,093	81,38,664	8,81,938	9.2
• Regular specialised secondary education	3,753	29,95,725	3,03,864	9.9
• Adult specialised secondary schools	1,614	10,39,639	55,192	18.8
• Vocational senior secondary schools	4,802	24,64,262	3,15,472	7.8
• Technical schools	2,924	43,04,232	1,92,575	22.4
Higher/tertiary level				
Colleges with specialised courses	1,280	95,88,501	4,12,624	23.2

Source: *China Statistical Yearbook* (2012).

It is worthwhile to note that of the 10,169 vocational schools at the secondary level (the three categories under the MOE), 71% (7,283 schools) are run by local government organisations (local departments of education and non-education) and local enterprises. Another, 28% (or 2,856 schools) are run by private players while only 30 schools are under the jurisdiction of the central ministries and agencies. According to MOE data, there were 12,663 secondary vocational schools with 21.13 million students by the end of 2012 (*China Daily* 2013). In India, there are about 10,000 schools offering 150 educational courses of two years duration (at 10+2 level, i.e., higher secondary level) in areas of agriculture, business and commerce, engineering and technology, health and paramedical, science, and home science catering to only about a million students (Planning Commission 2008). With the introduction of vocational education from Class 9 onwards, as a result of the implementation of National Vocational Education Qualification Framework (now the National Skills Qualification Framework, NSQF) the number of schools offering vocational education as well as the students undertaking the vocational stream at secondary levels is expected to increase.

Vocational education at the secondary school level usually spans over a three- or four-year period (depending upon the trade), and includes practical training in the related enterprises in the last year. The involvement of enterprises is mandated by the 1996 Vocational Education Law, which states that the vocational schools and training institutions should integrate education and training with production and serve the local economic development by maintaining close ties with local enterprises, in-training personnel and skilled workers (Article 23 of the 1996 Law). However, most of the vocational school and college

authorities express the lack of industry participation as one of the major challenges faced by TVET system in China, due to the generic nature of the guidelines for participation by the local enterprises under the VE Law of 1996 (IAMR 2014).

Another important characteristic of the Chinese vocational education at the secondary level is the way the curriculum is designed. One-third of the curriculum includes general academic training determined nationally by the MOE; another one-third which is again nationally determined caters to the particular trade; and the remaining one-third again with respect to the trade is however designed locally at the school level, in line with local enterprise needs (OECD 2010). Thus, not only is exposure to general academic skills facilitating horizontal mobility ensured, but vocational education tends to get aligned with industry needs as the curriculum takes into account local industry needs. None of this has been so far possible in India.

With economic expansion and the need for skilled workers, the thrust by the government on vocational education also expanded. Between 1980 and 2001, the proportion of secondary vocational school students among total secondary students increased from 19% to 45% with a concomitant decline in those pursuing general academic education at the secondary level. By 2008 it reached almost half of all students entering secondary education. In 2008, while only 2.5 million of the 19 million junior secondary graduates entered the workforce directly, eight million joined secondary vocational schools. In absolute terms, the expansion in total enrolment in vocational high schools was comparable to general senior secondary schools—from 12 million in 2000 to 22.4 million in 2010 for vocational education compared to 24 million for general stream (Hao 2012). Thus, the share of students taking up vocational stream in China is almost four times compared to the Indian average of 5% (students of the same age group) (IAMR 2014).¹ In India, even the dropout rate after completing elementary level education (i.e., up to Class 8) is still as high as 40% in 2010–11 (MHRD 2013). The increased employability and improved prospects for jobs in part address the low status attached to vocational education. The aligning of the VET curriculum with industry needs has significantly improved the employment prospects of these graduates. The employment rate was around 97% in 2012 for secondary vocational school graduates. Around 57.6% of these graduates get employment in the services sector, while those who are employed in the primary and secondary sectors accounted for 9% and 33.4% of all graduates respectively (*China Daily* 2013). In the Indian case, the employment rate of ITI graduates is way below, let alone that of vocational secondary graduates.²

Horizontal and vertical mobility of VET graduates is permissible in principle due to the National Level

College Entrance Examination (*Gaokao*). That is, VET graduates at the secondary level after clearing the examination can opt for general academic higher education. However, except for a few arts graduates from vocational schools, most of the vocational graduates find it hard to qualify for general academic higher education (IAMR 2014). On the other hand, graduates from ITIs in India often do not find enough opportunities for upward mobility even within the vocational education system.

The expansion of senior secondary vocational schools also resulted in a greater thrust on higher vocational education. Junior vocational colleges, advanced skilled workers institutions and vocational universities provide avenues for higher vocational education. Most of these institutes, similar to polytechnics in India, offer two-year diplomas for vocational education. Vocational higher institutes enrol students from both general and vocational secondary streams. Even research on vocational education is encouraged in China. Various research institutions have been established to promote vocational educational research at different levels. The total enrolment in Chinese tertiary VET institutions accounted for almost one-third of the total 27 million enrolment in all tertiary education institutions in 2009 and 2010 according to MOE estimates (Hao 2012).

Vocational Education and Training Outside School: The MOHRSS (the Ministry of Labour and Employment equivalent) is also responsible for vocational education and training and the vocational qualification system. The 1996 Vocational Education Law explicitly mentions that vocational training includes pre-employment training, apprenticeship training (as also conceived in India) but also interestingly on-the-job training and retraining for laid-off workers; and training for army men transferred to civilian work. Vocational training is imparted through skilled worker schools, employment training centres, enterprise-sponsored training centres and non-governmental vocational training organisations. The number of various training providers along with the targeted beneficiaries is shown in Table 2. The Indian government ITIs match the technical/skilled worker schools and employment training centres run by MOHRSS. The major difference however being that unlike India, the responsibility of running these institutes lies with the local human resource and social security bureaus.

Table 2: Number of Vocational Training Institutions and Trainees in 2006

Type	Training Institutions	Number of Trainees (in 10,000 Persons)
Technical schools/SWSs	2,855	270.3 Pre-employment training for out of school: 20.3 Laid-off and unemployed persons: 46 Migrant rural workers: 48.2 Employees/workers: 127.6 Others: 28.2
Employment training centres (job centres)	3,289	797.2 Pre-employment training for out of school: 72.8 Laid-off and unemployed persons: 340.9 Migrant rural workers: 262.7 Others: 120.8
Private/civilian-run training centres/non-governmental organisations (NGO)	21,425	1,905 Pre-employment training for out of school: 98.8 Laid-off and unemployed persons: 159.1 Others: 837.1
Enterprise-sponsored training centres	22,000	3,000 Employees/workers

Source: Adapted from Ding (2010) and Lai et al (2011) quoted in Potter (2011), from IAMR (2014).

The presence of state-owned enterprises has historically ensured industry participation in the VET system. In addition, industry participation is also mandated by the 1996 Vocational Education Law, which states that enterprises should provide vocational education for their staff, workers and persons to be employed. It also states that the enterprises may run jointly, or by their own vocational schools and training institutions. It is explicitly mentioned in the law that if any enterprise fails to conduct vocational education/training as mandated, and also refuses to undertake the same on the orders of the local county government, then the enterprise should pay the requisite vocational education funds to be borne for vocational education in the locality (Articles 20 and 29). These enterprise-sponsored training centres inculcate apprenticeship and on-the-job training. In addition to these enterprise-sponsored training centres, according to World Bank data, around 90% of Chinese firms provide in-firm, in-house training (also because they are mandated under the law), compared to only 20% of all Indian formal enterprises—among the lowest in the emerging market economies (Mehrotra and Ghosh 2014).

Training of Vocational Education Teachers/Trainers:

Training of vocational trainers is another important dimension of the VET system. The efficiency of vocational education and training outcomes crucially depends on the training of vocational teachers and trainers. This aspect is very carefully designed in the Chinese TVET system which requires the training of these instructors to be at par with industry needs and new technologies. For teachers to be hired at vocational schools and training institutions, the system has strict guidelines which require teachers at vocational secondary schools to be at least vocational graduates, and those only with post-graduate vocational degrees and the respective occupational certificate can teach at vocational undergraduate colleges (IAMR 2014). This is in contrast to the ITI system where in most of the private ITIs, the trainers were found to be themselves merely ITI graduates (IAMR 2013).

A great emphasis is placed on training of vocational teachers with a number of higher education institutions being set up. In addition, in order to equip them with newer technologies and real-time industry exposure, the teachers in vocational secondary schools are required to undergo one month (or two months) training every year (or every two years) in industry for their career progression and promotion (OECD 2010). The school authorities provide teachers with financial support during training. Thus, the incentive-induced system of teacher training results in better learning outcomes at the vocational secondary level.

2 Major Reforms in the Chinese TVET System

Despite constant strides in reforming education and skills training through the 2000s, with various state council decisions (one in 2002 and the other in 2005), the overall knowledge and skills levels of the China's large labour force were still perceived to be low with noticeable skill demand-supply gaps. The Chinese government considered the VET as a

weak link after the near universalisation of primary and lower secondary enrolments post the nine-year Compulsory Education Act of 1986. The MOHRSS estimated that in 2008, of the 140 million employees in the Chinese urban enterprises, merely half could be classified as skilled, with only about 4% holding advanced skill certificates (Hao 2010). The state council report (2009) found that the TVET system in China suffered from slow pace of growth of VET compared to the growing needs of the economy; deficiencies in the VET administration and management at both the macro and micro levels; inadequate coordination between VET at tertiary and secondary levels on the one hand and between VET and general education streams on the other, shortage of teaching personnel and inadequate resources (Hao 2012). India too is grappling with similar TVET challenges and we can draw lessons from the Chinese experience to reform our own TVET system.

Various measures were accordingly undertaken to reform the vocational system with suitable VET provisions—the Employment Promotion Law (2007), the Twelfth Five Year Plan, 2010–15 (2010), the National Long and Medium-Term Planning Outline of Education Reform and Development: 2010–20 (Ministry of Education 2010), the Action Plan of Secondary VET Reform and Innovation (2010–12) (Ministry of Education 2010), the Amendment of the Vocational Education Law (in process) (Hao 2012; IAMR 2014). While VET became a critical aspect of the Chinese education system with the 1996 Vocational Education Law, in early 2009, the Chinese government designated VET as the next target of education system improvement, giving priority to secondary VET and VET in rural areas (Hao 2010).³ Targets were set to increase incremental and total enrolments at the secondary and tertiary VET institutes. In order to improve the administration of the VET system, the provincial governments with the help of social organisations were given greater responsibility to introduce VET reforms. In addition, to create greater public awareness and strengthen enforcement of VET access regulations and certification, it was proposed to launch public education programmes to support VET (Hao 2012).

The next major stride in educational reforms in China was seen in 2010 when the National Outline for Medium and Long Term Educational Reform and Development (2010–20) was released with the aim of modernising the education system, including VET. It specifies the deliverables of the education sector to be achieved during the 10-year period. In order to further the development of the Chinese TVET system, the reform focused on equal access and quality. To meet the needs of industrialisation, the policy set the target of training five million people in key economic areas like agricultural science, equipment and manufacturing, modern transportation, finance and accounting, information and technology (IT) and environmental protection; and around 8 million for social sectors like health, education, politics and law, and disaster prevention.⁴

The educational reforms of 2010 outlined the need for laws to institutionalise cooperation between VET schools and enterprises for an efficient VET system. Such an arrangement helps both schools and enterprises by providing apprenticeship

training to the students and opportunities for teacher training by the enterprises, as well as training of their employees by the VET institutions—in the process being mutually beneficial to all. In addition, the enterprises are also encouraged to increase investment in vocational education and training.

To improve the quality of training at school and college level, in 2006, the Ministry of Education in China launched the project of developing top-200 National Demonstration Schools and Colleges, also called “key national schools,” with state of the art technology. The key national schools were to be established with certain centrally-determined standards in terms of teaching/training equipment, pupil–teacher ratio, teacher qualifications and school administration. The schools and colleges, to be able to achieve the status of National Demonstration Schools/Colleges and be eligible for national grants, have to achieve these quality standards (OECD 2010). These demonstration schools and colleges have made significant progress in industry participation and jointly-run programmes, facilitating better learning and placements of students.

Further, the government introduced a dual-certificate system under which students earn both a diploma and a professional qualification. To address two major issues—rural–urban migration and increase in agricultural output—agricultural schools in China provided green certification and entrepreneurship training with a combination of classroom instruction in the field to rural workforce.

China’s Twelfth Five Year Plan (2011–15) also emphasises greater promotion of VET, especially in rural areas. The plan envisages upgrading the Chinese labour force currently engaged in low-end manufacturing to be advanced to a more knowledge-based economy, driven by innovation and environment-friendly technologies (Hao 2012). Accordingly, as mentioned in the Education Reform Plan of 2010–20, the labour force is to be skilled in these areas. The Twelfth Plan also lays down an approach to combine classroom teaching with workplace training, encouraging greater cooperation between VET schools and enterprises in curriculum development, training and placements encouraging on the shop-floor apprenticeship training.

The plan also launched an initiative called the “VET Basic Capacity Building Project” which along with expanding best practices in VET at various levels also aims to promote a “Dual Qualification Programme” among VET teachers. Dual qualifications imply certification in both teaching and occupational skills (Hao 2012). For instance, Chongqing Normal University is one that imparts training for headmasters and key teachers for VET. The university conducts collaborative programmes with Australia, Germany and Canada in providing the training (IAMR 2014).

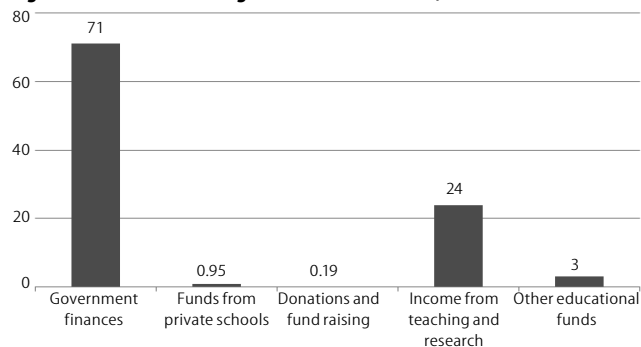
In line with the emphasis in the educational reforms of 2010, the Twelfth Five Year Plan also envisages programmes to ensure industry collaboration in building VET in China. For instance, local governments incentivise industries by offering them tax breaks and subsidies in acquiring land. In return the industries are encouraged to invest money in vocational schools and provide equipment. Industry too participates in

the vocational education and training in China in multiple ways. The vocational institutes run tailor-made modules as per the needs of industry, and the industry absorbs these trained students. Further, the private enterprises impart training and provide staff to teach in vocational educational college free of cost and later absorb them in their factories. Recently, the Ministry of Education in China implemented, on a pilot basis, projects to assess the potential policy advancements and needs of VET institutes in Tianjin, Sichuan, Chongqing, Hubei and Henan. These pilot projects have made an endeavour to address the challenges faced in the VET system through better school-enterprise collaborations (Potter 2011).

3 Financing TVET

The state continues to be the main source of financing education in China. For instance, about 75% of expenditure on education is borne by the government (*China Statistical Yearbook 2012*). Since the Chinese economy is fiscally decentralised and education is under the jurisdiction of local governments, the local government bears the major share of state expenditure on education. Vocational education too is funded by the state. For instance, 71% of the total expenditure on vocational education is funded by the government (Figure 1). The local governments are the major source of government finance for vocational education at the secondary level, while the central government in addition to providing funds for the national programmes is responsible for higher education.

Figure 1: Sources of Funding for Vocational Schools, 2010



Source: *China Statistical Yearbook* (2012).

These provisions are also mandated under the Vocational Education Law of 1996. Article 30 of the law directs the provincial governments, autonomous regions, and municipalities to set aside funds for vocational education from the local charges they collect for education under the Education Law. The law also specifies that the governments may appropriate funds for rural vocational training from the funds earmarked for developing agricultural science and technology. It is also in the law that students with financial difficulties or disabilities be provided with tuition fee waiver for vocational education and training.

In addition, since 2009, the government took the initiative to make tuition free of cost for senior secondary vocational school students (OECD 2010). To overcome the financial burden on students on account of vocational education fee, the government introduced a national scheme to provide Chinese yuan (CNY)

1,500 per year subsidy to *v*ET students from rural areas to cover their tuition fees and boarding/lodging expenses. Most of the provinces, however, extended this subsidy to all poor students. This is why government finances have a higher share in sources of funding for vocational education. And hence, students' contribution in terms of tuition fees does not figure in the sources of funding.

Since local governments have to raise their own revenues (often by competing for foreign investments) to fund vocational education, the resources of vocational schools depend upon the resources of provincial and county governments. However, with economic development concentrated mostly around coastal provinces, schools in rural and poorer provinces remain under-resourced (OECD 2010).

4 Lessons for India

From the preceding three sections the reader may be excused if she got the impression that all is well with China's *v*ET system. There is enough evidence from surveys to suggest that the situation is more complex. Thus, the American Chamber (AmCham) China reports that aside from rising labour costs, high turnover rate, and the impact of regulations, the severe shortage of appropriately skilled employees is among the human resource challenges that remain a major concern for AmCham China members. Out of 266 members surveyed in 2012, around 70% reported they encountered difficulties in attracting and retaining skilled as well as technical staff. According to AmCham China (2011), quality and mobility of the skilled labour pool in China are seen by domestic and foreign firms as long-term challenges despite significant efforts by the government to improve the quality of skilled workers. Despite the rapid increase in skilled workers, the shortage of skilled employees across all job types persists (AmCham China 2011). In 2013, more than a third of the Chinese firms surveyed said they struggled to recruit skilled workers, with 61% of these companies attributing this to a shortage of general employable skills (Chen, Mourshed and Grant 2013).

The two main reasons cited by many employers behind this shortage are skills mismatch and inappropriately skilled university graduates in the face of growing demand for skilled labour (AmCham China 2011). In addition, the rapid growth of state-owned and private enterprises in China represents an additional challenge in the supply-side. These issues constrain the flow of investment and expansion of businesses in China.

Clearly, Chinese firms also face skill-related problems. The reasons are not hard to find: sustained growth of the economy at 10% per annum for three decades has intensified the demand for skilled workers, and as wages have risen, the search by firms for more skilled workers has increased. It appears that as the Chinese economy moves up the value-chain ladder, the search for more and more skilled workers will only increase. However, compared to the stage of development of manufacturing in India, there is much to be learnt from the already achieved success of the Chinese *v*ET system, and its ability to supply the skilled workers required for China having become a manufacturing hub of the world, at least in respect of low cost,

low technology items, though increasingly Chinese industry has moved up the value chain as well.

The preceding sections highlighted the key features, major reforms and financing of the Chinese *v*ET system. In light of the similarity in challenges faced by Chinese administrators at an earlier stage of development, we can draw significant lessons from the Chinese experience for the central/state governments in India, as well as the private sector. To reap the benefits of the demographic dividend, available to India only till 2040, it is crucial that the skill development needs of our workforce, and demand for skilled workers are addressed. The high growth of manufacturing and the Chinese economy are in part attributed to the efficiency of the Chinese *v*ET system and the state's commitment of legal and monetary support to technical and vocational education. Based on other primary surveys we have conducted in India, it has been argued that when industry fails to find semi-skilled and skilled staff, they have had to adopt more capital-intensive methods of production, thus displacing labour with machines (Mehrotra et al 2014). This may enhance productivity, but this reason for adopting capital-intensive methods, albeit such methods increase productivity, is questionable in this case as it is driven mainly by the sheer shortage of skilled workers. Thus, reforming our skill development system is particularly pertinent for India if manufacturing jobs are not to be lost due merely to the shortage of skilled personnel, which drives up wages. In fact, more skilled workers will only enhance productivity, and equally importantly the quality of output, thus enabling manufacturing as well as services to move to a higher growth trajectory, which can create more jobs in the future. This is especially true of manufacturing, whose share in gross domestic product (GDP) and employment has remained stagnant for over two decades. In fact, one of the lessons of the Chinese *v*ET system is that jobs can be created in manufacturing precisely at the same time as productivity is growing.

The Vocational Education and Training Law: The enactment of the 1996 Vocational Education Law of China has been the landmark step for the Chinese *v*ET system. As was discussed in earlier sections, the law has the provisions for integrating education and training with the industrial process with the participation of local enterprises. In addition, it provides for adult training as well as vocational education and training in rural areas.

Many other countries have such an act to ensure legal backing to vocational education and training in their countries (for example, Australia, United Kingdom and Germany). A similar act should focus on all tenets of the skill development system, laying out the specific responsibilities of the centre and the state on the one hand, and skill providing institutes and industry on the other. The aspects of regular revision of curriculum in line with local industry needs, certification, and teacher training should also be included into the act. The act in India should be comprehensive, and should plan to take into account every aspect of vocational education and training—vocational education in secondary schools, in higher education colleges, vocation training in training centres, adult training and

retraining for those already in labour force, training of vocational trainers, curriculum design, industry participation and financing of VET.

Currently all certification that is recognised is offered by government institutions in India. However, if TVET is to become more widespread, rather than merely supplying workers for the organised sector activities, the government has to permit the recognised and accredited institutions in India in the private sector to provide certification. A VET law in India should take into account the need for private Chambers and Sector Skills Councils offering certification.

Combining Economic Activities and Skill Development: If China is a manufacturing giant in the world, it has partly to do with the policymakers' ability to: (a) build a foundation of VET over many years; and (b) continuously upgrade the TVET system in response to China's growing manufacturing share in world manufacturing output. India is planning to increase the share of manufacturing in GDP from 16% in 2009–10 to 25% by 2022. Thus, while the Twelfth Five Year Plan, in the Industry Chapter, has articulated the need for an Industrial Policy, the skills or TVET preconditions for such an industrial policy also need much more careful elaboration than has happened so far. The most important lesson from the Chinese experience is that the sheer scale and size of their TVET system dwarfs India's.

India's National Skills Policy (NSP) (2009) is being reviewed and the experience of China must be used in redefining the NSP. India cannot match the scale and size of China's TVET system without ensuring that India's 10,000 secondary/senior secondary schools have a vocational education stream. Currently, vocational education is offered only at the senior secondary level in India (i.e., classes 11–12). Two years ago the Ministry of Human Resource Development of the Government of India had approved a National Vocational Education Qualifications Framework which mandated the inclusion of vocational education from Class 9 (i.e., to start immediately after children complete the compulsory eight years of general academic school till elementary level) (Mehrotra, Mehrotra and Banerji 2012). However, that has been introduced only in 2000 or so secondary schools in 22 states at the time of writing in late 2014.

Clearly, age 15 years, when Indian children enter Class 9, is the start of the working age, according to Indian law. So, many children drop out after completing eight years of elementary school, and many well before that. Starting a vocational stream in every secondary school in India would begin to match the Chinese system that has existed for decades. As we noted, half of all children completing nine years of compulsory schooling in China enter senior secondary vocational schools. In India the comparable share at senior secondary level is 5% (of a smaller base). Given that now the Government of India has created a separate ministry for skill development and entrepreneurship, working towards a law for skill development may also be more feasible, unlike before when the responsibility of skill development was shared by a number of ministries.

Stipend Only for Vocational Students: In India, like in China decades ago, very few students opt for vocational stream, which is often perceived as a dead-end. Only about 5% of the population in the age-groups 19–24 years has acquired some sort of skills through vocational education in India (Planning Commission 2013). Encouraging students to opt for the vocational stream in secondary high schools through measures like stipend for rural students for boarding and lodging, making tuition fee free of cost (since 2009) for all students has shown very positive outcomes for China's vocational education. Around 95% employment rate of senior secondary vocational school graduates speaks for the external efficiency of China's TVET system. In India, as we noted earlier, at the beginning of the Eleventh Plan only 5% students were enrolled in vocational courses at the secondary level (Planning Commission 2013).

Teacher Training: Improving the quality and enhancing employability after completion of vocational education or training will also increase the attractiveness of TVET in India. As of now, only around 15%–20% of vocational graduates are employable at the completion of their academic programmes (BCG CII 2013). A significant achievement of China's TVET system has been the element of training of teachers/trainers at the vocational education and training schools and institutes. Teachers in vocational schools are required to undergo one month in industry each year, or two months every two years for their career progression and promotion. The practical training at the enterprises equips them with latest technology and evolving industry needs. In India, around 32% of the trainers in vocational institutes do not have any formal certificates. A significant proportion of them has neither the requisite teaching skills nor the relevant industry experience. Due to poor career-growth prospects, the attrition rate is also high among faculty in vocational institutes (BCG CII 2013).

The Twelfth Five Year Plan recognises the importance of training of trainers for effective functioning of TVET system. The scheme of vocationalisation of school education envisages the provision for in-service training of seven days for 2,000 existing vocational education teachers and induction training of 30 days for 1,000 new vocational education teachers (Planning Commission 2013). Clearly this limited exposure to practical training for TVET teachers in India is not sufficient, and should be evaluated, and adjustments made if necessary. While the latest budget (2014–15) proposes to provide for Rs 500 crore for "Pandit Madan Mohan Malviya New Teachers Training Programme" to infuse new training tools and motivate teachers, it is important that teacher training should be linked with real-time industry exposure.

Curriculum Design: In China, local industry participation is encouraged and has been provided for in the 1996 Vocational Education Law. The curriculum of a senior secondary vocational school is designed in such a way that, one-third includes general academic skills defined nationally by the Ministry of Education, another one-third is again nationally defined content associated with the particular occupation, and the remaining

one-third defined again with respect to the occupational field is determined locally at the school level with the help of local enterprises. This shows the flexibility of the Chinese TVET system. The curriculum for each trade has a local content. There is no such flexibility permitted in either ITIs in India, nor in senior secondary vocational schools (Mehrotra 2014).

In China, to ensure that curriculum is responsive to industry demands, the focus and distribution of trades in the curriculum for primary, secondary and tertiary sectors is in line with the economic structure. For instance, in Chongqing, the shares of primary, secondary and tertiary sectors are 8%, 55% and 37% respectively. Accordingly, the focus of trades in the curriculum for the respective sectors is 7%, 52% and 41% respectively (learnt from discussions with Chongqing Municipal Education Commission). Again, this kind of flexibility and responsiveness to local need and demand would be unheard of in the Indian TVET system. Thus, for an ITI principal to introduce a new course in India is such a tedious, bureaucratic and cumbersome process, requiring approvals all the way up to the state capital that no ITI principal would attempt it. By contrast, we noted in Chongqing that the city has become a world manufacturing hub for laptops, mobiles and automobiles (one-third of the world's laptops are made here). The TVET system in the city is totally geared towards meeting the needs of these manufacturing sectors. By contrast, in India, the border district of Gurdaspur (Punjab) has 800 foundry forge units but the town's ITI has no course that might cater to the unit's needs for skilled manpower.

Local Industry Needs and Participation: The local governments in China try to attract the support of the enterprises in TVET. The local enterprises because of fear of punishment (taxation or negative publicity or mark on reputation) at the hands of local governments (empowered by the provisions of the 1996 Vocational Education Law) do participate in practical training. The local governments help local enterprises by incentives such as allotment of land at subsidised prices, or preferential treatment in case of award of government projects. Such measures prove to be influential in encouraging industry to actively participate in vocational education and training and can be adopted in case of Indian firms as well.

In India, there is huge demand for skilled workers compared to supply, especially in terms of engineering and managerial talent. Both the government and industry need to invest in training infrastructure and vocational education and training. Enterprises should come forward with collaborations with training institutes and should look inward to assign priority to in-service and pre-employment training and skilling (BCG CI 2013). Industry should consider offering their staff as trainers/instructors and master trainers to TVET institutions in India, since teachers are in short supply in both ITIs as well as vocational secondary schools.

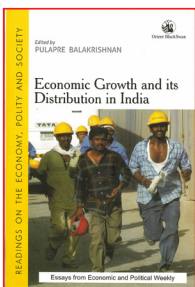
Due to years of underinvestment in skill development, India has one of the least skilled manpower among the top manufacturing nations. Only 17% of those entering the workforce are skilled (of which the vocational component is only 4%). Compared to this, in China, 59% of those entering the workforce

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are skilled, of which 39% are vocationally trained. Even more worrying aspect on quality grounds is that among those who are skilled, only 5% of workers can be classified as highly skilled and around 64% are considered skilled at very low levels. Over 65% of Indian firms face difficulty in filling job vacancies with appropriately skilled workers. The skill gap is expected to worsen and reach about 100 million by 2025 (BCG CII 2013). This can prove to be a serious hindrance for achieving the targets of the New Manufacturing Policy.

Financing TVET: The 1996 Vocational Education Law requires that 20% of the annual education budget be allocated to vocational education and training (Potter 2011). The fiscal decentralisation of the Chinese (unitary) system of governance and autonomy of the local governments play an important role in the implementation of vocational education, for vocational education at the secondary and senior secondary levels is the responsibility of township and county governments, while higher education is under the central and provincial governments. The local governments set aside a special sum or arrange a portion for vocational education from the local extra charges that they have decided to collect for education, and in addition can appropriate more funds for rural vocational training.

To overcome the financial burden and to ensure that poor Chinese students continue in VET schools, a subsidy of CN¥ 1,500 per year is offered per student, for their first two years at secondary vocational schools to cover their fees. Since 2009 tuition fees for senior secondary vocational schools was made free of cost for all students. This policy initiative is particularly relevant in the case of India, where graduates from vocational training providers indicated that they are usually from poorer economic backgrounds with household incomes of Rs 5,000 per month and below (Mehrotra 2014).

Finally, all enterprises in China, as a policy, are required to utilise 1.5% of their payroll towards in-service training, which if they fail to do, should contribute an equivalent amount to the government to be used towards adult training. There is a strong case for developing a National Training Fund, which has been recommended in India's Twelfth Five Year Plan (Chapter 22: Employment and Skill Development; also Mehrotra and Ghosh 2014). The plan envisages setting up a training fund, in the form of tax levies to be collected from large and medium enterprises (to begin with), for mobilisation and allocation of resources for skill development. The financing of skill development in India through a training fund should also consider subsidising poor students to pursue vocational education and training.

NOTES

- 1 The estimate is based on the cumulative account of not more than 3% students attending senior secondary vocational schools and those entering Industrial Training Institutes (ITIs) after completing Class 10 (BCG CII 2013).
- 2 In a nationwide survey of ITIs conducted by IAMR it was found that the employment rate of ITI graduates was 71% with around 18 months waiting period after they had graduated (IAMR 2013). These estimates are not much different from earlier ones by World Bank (2008) and the International Labour Organization (2003).
- 3 The annual report to the People's Congress in March 2009 by Premier Wen Jiabao.
- 4 China's TVET: Reform and Opening-up, Speech at the WFCP 2012 World Congress Jiang Bo, Secretary-General, CEAIE, 27 May 2012, Halifax, Canada.

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