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Apprenticeship and Small and Medium-sized Enterprises - The China Case

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Apprenticeship and Small and Medium-sized Enterprises – The China Case

Report of a desk study and a field research mission conducted in May-June 2013 the framework of the ILO "Global Product" Project

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Sources used:

1) Literature and statistics (list of literature in the annex)

2) Interviews with resource persons, among them Prof. Dr. Zhao Zhiqun, Beijing Normal University, Prof. Jiang Dayuan, former researcher at the Central Institute for TVET[1], Beijing, and Ms. Britta Buschfeld, Director Vocational Training, German Chamber of Commerce, Shanghai

3) Visits in Shanghai, Jiangsu Province (5 days with Kong Zhigang, visiting 5 Technical Colleges and 2 companies), Wuhan (capital of Hubei Province) and Beijing.

[1] The term "TVET" used in this study stands for "Technical and Vocational Education and Training" and incorporates all types of technical and vocational education and training, at all levels: primary, secondary and tertiary education level. So it includes the school-based types of education-training, apprenticeship and the combination of school-based and workplace based ("dual") training, even the Vocational Colleges at the tertiary education level.

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List of Abbreviations

ABB	Asea Brown-Boveri
BSCI	Business Social Compliance Initiative
CNTAC	China National Textile and Apparel Council
CEC	China Enterprise Confederation
COOP	Cooperative Retail Company, Switzerland
CSR	Corporate Social Responsibility
DWCP	Decent Work Country Programme (ILO)
ILO	International Labour Organisation, International Labour Office
OECD	Organisation for Economic Cooperation and Development
SCORE	Sustaining Competitive and Responsible Enterprises
SECO	State Secretary for Economics, Switzerland
SME	Small and Medium Enterprises
SoE	State-owned Enterprises
TVET	Technical and Vocational Education and Training

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1 Introduction: The ILO "Global Product" and the rationale for the China case study

The present case study on apprenticeship and SME's in China is part of a larger research & development exercise in the framework of the ILO "Global Product" project. This project aims:

> *"To explore and expose the evidence on the business case for responsible workplace practices, through targeted research, with the aim of strengthening the evidence base and clarifying how the argument can be applied to underpin future ILO interventions and policy guidance."(ILO 2013)*[2]

The "Global Product" project explores and later tests the interconnections between enterprise productivity, conditions of work and skills development, and it tries to identify cause-and-effect relationships found in the context of SMEs, particularly in developing countries.

In a first stage (2013), the case studies on a number of key countries will be compared and confronted with research reports and other studies. In a second stage, a kind of "toolkit" will be developed and tested with interested stakeholders in selected partner countries (2014). Based on this solid evidence and some practical experience, the ILO will be able to provide in the future technical assistance to governments, employers and workers organisations in partner countries, which are keen to engage on the path of introducing or reinforcing modern apprenticeship with a focus on SMEs.

A case study on SME's and Apprenticeship in China was added, as China is already mentioned as an example in the OECD note on "Quality Apprenticeships" for the G20 Task Force on Employment. China is also of general interest, as the country has been, during more than two decades, one of the fastest growing economies on the globe, combining modern enterprises reaching the highest technology levels with rather under-performing industries and small-scale businesses on the countryside as sub-contractors, which are working under much less favourable conditions, sometimes on the margin of "decent work" and "safety and health", and with difficulties in recruiting adequately skilled workers and staff.

A number of research questions were formulated before take-off of the case study. These questions will be discussed at the end of this report, although some of the necessary evidence is still missing or rather superficial. The list of research question is presented here after, in order to show the guiding considerations and the framework for the case study.

According to the Terms of Reference, the study on apprenticeship in China was supposed to elucidate the following tentative research questions:

[2] Vision Statement of the ILO "Global Product": *"To drive economic growth and achieve better working and living conditions for a majority of workers, by enabling SMEs to adopt practices that capitalize on the synergies between higher productivity and improved skills, working conditions and occupational safety and health."*

1) What is the relevance of apprenticeship for companies, especially SMEs, and specifically in the sectors of electronics, textiles and automotive? (the core sectors of the SCORE project)
2) Which relevance does apprenticeship have for key stakeholders in the economy: Employers' associations, workers representatives in companies and trade unions, and public authorities, foreign partners and investors?
3) Are apprenticeships a valuable way to promote skills development in China?
4) What is the relative importance of apprenticeship, as compared with other branches of the TVET system in China?
5) In which ways are the targeted SME's and key stakeholders involved, or taking the initiative, in making apprenticeship more relevant and beneficial for SME's? Which types of initiatives and activities do they undertake in this respect?
6) What are the characteristics of enterprises using apprenticeships: Sector, size, level of qualifications needed? Do some sectors use apprenticeships more than others? What about electronics, textiles and the automotive industry (the sectors targeted by the SCORE project)?
7) Is the specific Chinese version of apprenticeship at the post-secondary education level (the so-called "Dual Studies", where students-trainees combine study phases at a Vocational College with practical work and training phases in associated companies) a promising avenue? Is it applicable for SMEs in the electronics, textiles and the automotive industry?
8) Is the legal and regulatory framework in China conducive for the expansion of apprenticeship? Which adaptations would be needed? How about tax reductions and other types of incentives for SME's engaging in apprenticeships?
9) Is there some meaningful experience of international cooperation projects having supported the introduction / strengthening of apprenticeship in Chinese enterprises, with a focus on SMEs? What can be learned from them?
10) Is the present apprenticeship provision able to adapt to the challenges of a modern economy, which is gradually upgrading to higher levels of sophistication (higher value-added in the design, production and marketing process), but also gradually moving from crafts and industry to services?
11) What are the lessons, which the "China case" could teach to the international community, and which could become part of a future "ILO apprenticeship modernisation and improvement kit"? Which tools would be essential for such a kit?
12) Which are the specific needs of Chinese employers, a) who are already involved in apprenticeships, b) who are potential candidates for introducing new apprenticeships in their organisations?
13) Which complementary measures should be taken, in order to improve the quality of apprentice training? Which are the necessary "technical assistance" and support services? Which role can the TVET providers outside the companies play in this regard?

14) Which are the organisations and institutions willing to "advocate" the interests of companies and other employers concerning apprenticeship? Organisations representing and defending the interests of apprentices, associations or networks of TVET providers involved in the external support part: theoretical and practical training phases, modules and components outside the companies where the apprenticeship takes place. Which are the specific services these organisations can offer within their statutory responsibilities, without generating additional cost?

2 Description of the SMEs in China

2.1 Government economic policy

Wen Jiabao, Prime Minister during the two 5-year periods of the National People's Congress from 2003 to 2008 and from 2008 to 2013, delivered his last "Report on the Work of the Government" in front of the Chinese People's Congress on March 5, 2013. (Jiabao 2013, 20, 23)

The report highlights the major challenges, which the Chinese economy is facing in agriculture, industry and services. Two text blocks are quoted here, the first one addressing the subject of industry and the second the subject of employment:

> *"The important task is to optimize resources allocation and industrial distribution, and solve the following problems: excess production capacity, the lack of core technology, products with low value-added, low-level and redundant industrial projects, and different regions having similar industrial structures. We must accelerate the transformation and upgrading of traditional industries, energetically develop new and high-tech industries, and raise product quality and competitiveness." (20)*

The statement regarding employment underscores the three aspects of employment services, vocational skills training and business start-ups.

> *"We should do all we can to increase employment. We should persevere in implementing the strategy of giving top priority to employment and adopt a more proactive employment policy. We should create more jobs by maintaining stable economic growth and adjusting the economic structure and provide better vocational skills training to help people to find jobs or start their own businesses. We should increase government spending and policy support, improve the employment services system, stimulate employment by encouraging business startups, assist target groups in finding jobs, and stimulate sustained, steady increases in urban and rural incomes."(23)*

The whole policy document avoids any statement regarding the specific roles, needs and potentials of micro, small and medium-sized enterprises (M)SME's), their managers and their capital owners. The feature behind is that most companies in strategic sectors are state-owned, whereas a large part of (M)SMEs is in private or collective ownership. It seems that there is no agreed policy on how to tap the potential of (M)SMEs, which support should be given (technical, financial, other) and how to deal with them in the future: a) supportive, b) tolerant or c) restrictive approach.

2.2 Classification of SMEs

The official classification of enterprises differentiates SMEs by size, dividing them in 4 categories: large, medium, small and micro enterprises. The indicators are specified per branch, differentiating between 14 branches plus 1 miscellaneous. The size is mainly defined by the two criteria *a) staff number* and *b) annual revenue*:

1) For 10 out of the 15 branches, the two indicators *staff number* and *yearly operational revenue* are used for defining the size of companies;
2) For 3 branches, the first indicator is *total capital assets* (Construction, housing development business and renting and commercial business), the second indicator being either the *staff number* or the *yearly operational revenue* of the company.

Table 1: Official classification indicators for Large, Medium and Small Enterprises in China (2011)

	Branch	Indicator	Unit	Large enterprise	Medium-size enterprise	Small Enterprise	Micro enterprise
1	**Industry**	Staff number	Person	≥1000	300-1000	20-300	＜20
		Operational revenue	10 000 Yuan	≥40000	2000-40000	300-2000	＜300
2	**Construction**	Operational revenue	10 000 Yuan	≥80000	6000-80000	300-6000	＜300
		Capital (assets)	10 000 Yuan	≥80000	5000-80000	300-5000	＜300
3	**Wholesale business**	Staff number	Person	≥200	20-200	5-20	＜5
		Operational revenue	10 000 Yuan	≥40000	5000-40000	1000-5000	＜1000
4	**Retail sales business**	Staff number	Person	≥300	50-300	10-50	＜10
		Operational revenue	10 000 Yuan	≥20000	500-20000	100-500	＜100
5	**Transport and communications**	Staff number	Person	1000	300-1000	20-300	＜20
		Operational revenue	10 000 Yuan	≥30000	3000-30000	200-3000	＜200
6	**Postal services**	Staff number	Person	≥1000	300-1000	20-300	＜20
		Operational revenue	10 000 Yuan	≥30000	2000-30000	100-2000	＜100
7	**Housing and hospitality business**	Staff number	Person	≥300	100-300	10-100	＜10
		Operational revenue	10 000 Yuan	≥10000	2000-10000	100-2000	＜100
8	**Agriculture, Forestry, Livestock raising,**	Operational revenue	10 000 Yuan	≥20000	500-20000	50-500	＜50

	Fisheries						
9	**Storage**	Staff number	Person	≥200	100-200	20-100	＜20
		Operational revenue	10 000 Yuan	≥30000	1000-30000	100-1000	＜100
10	**Housing development business**	Capital (assets)	100 000 Yuan	≥1	0.5-1	0.2＜0.5	＜0.2
		Operational revenue	100 000 Yuan	≥20	0.1-20	0.01＜0.1	＜0.01
11	**Information transmission**	Staff number	Person	≥2000	100-200	10-100	＜10
		Operational revenue	100 000 Yuan	≥10	0.1-10	0.01-0.1	＜0.01
12	**Software and Information technology**	Staff number	Person	≥300	100-300	10-100	＜10
		Operational revenue	10 000 Yuan	≥10000	1000-10000	50-1000	＜50
13	**Renting and commercial services**	Staff number	Person	≥300	100-300	10-100	＜10
		Capital (assets)	100 000 Yuan	≥12	0.8-12	0.01-0.8	＜0.01
14	**Logistics (commodity management)**	Staff number	Person	≥1000	300-1000	100-300	＜100
		Operational revenue	10 000 Yuan	≥5000	1000-5000	500-1000	＜500
15	**Other**	Staff number	Person	≥300	100-300	10-100	＜10

Source: Ministry of Industry and Informatisation, State Central Statistical Office, State Development and Reform Commission, Ministry of Finance, joint publication, 18 June 2011

It is interesting to analyse the overall table more specifically concerning the size limits of micro and small enterprises. At a first glance, the size limits for micro enterprises seem quite high and the staff numbers in small enterprises would rather correspond with medium-sized enterprises in Europe.

Table 2: Staff number limits for Micro and Small Enterprises

	Branches	Branch number	Staff limits for Small Enterprises	Upper staff limit for Micro Enterprises
Group 1	• Wholesale business	• Branch n° 3	Between 5 and 20	less than 5 persons
Group 2	Industry and services: 1) Retail sales business 2) Housing and hospitality business 3) Information Transmission 4) Software and Information technology 5) Renting and commercial services 6) Others	1) Branch n° 4 2) Branch n° 7 3) Branch n° 11 4) Branch n° 12 5) Branch n° 13 6) n° 15	Between 10 and 50 Between 10 and 100 10 – 100 10 – 100 10 – 100 10 – 100	less than 10 persons < 10 < 10 < 10 < 10 < 10
Group 3	Industry and services: 1) Industry 2) Transport and Communications 3) Postal Services 4) Storage	1) Branch n° 1 2) Branch n° 5 3) Branch n° 6 4) Branch n° 9	Between 20 and 300 20 – 300 20 – 300 Between 20 and 100	less than 20 persons < 20 < 20 < 20
Group 4	• Logistics (commodity management)	Branch n° 14	Between 100 and 300	less than 100 persons

Note: For those branches, which do not appear in the table above (Branches 2, 8 and 10), the indicators for defining the size of enterprises are monetary indicators (capital and revenue) and not the number of staff.

In the EU, the two criteria *staff number* and *annual turnover* or *total of balance sheet* are used to delimit (M)SMEs by size. According to the EU Recommendation n° 2003 / 361, the size limits for SMEs in the European Union are the following:

Table 3: Size limits of MSME's in the European Union

	Indicators	Medium-sized Enterprise	Small Enterprise	Micro Enterprise
1	Staff number	< 250	< 50	< 10
2	Turnover	≤ € 50 million	≤ € 10 million	≤ € 2 million
3	Balance sheet total	≤ € 43 million	≤ € 10 million	≤ € 2 million

Source: European Commission (2005)

In the 27-member EU, there were more than 20 million SME's by the end of 2012, representing 99% of all EU companies and employing around 75 million people. 90% of SMEs are actually micro enterprises with less than 10 employees. (European Commission, 2013)[3]

Turning back to the China case, it is important to highlight that there is no specific treatment for SMEs in China, albeit their capacity of creating employment and wealth.

2.3 ILO involvement in SMEs in China: Corporate Social Responsibility in textile & garment, Decent Work Country Programme and the SCORE project

In China, ILO has a track record with having implemented a Corporate Social Responsibility (CSR) project in the textile sector and a "Decent Work Country Programme" (DWCP) in the period 2006 – 2010. The CSR project, a joint initiative of ILO, UNIDO and the China National Textile and Apparel Council (CNTAC), started in 2008. 30 pilot companies in Guangdong, Zhejiang and Jiangsu provinces participated in this project. Its activities concentrated on developing a set of training materials and training staff of the participating companies. (UNIDO/ILO 2014)[4]

Regarding the **"Decent Work Country Programme"**, a project agreement for a new 3-year phase 2013 – 2015 has been signed recently between ILO and its Chinese tri-partite counterparts: the Ministry of Human Resources and Social Security, the All-China Federation of Trade Unions and the China Enterprise Confederation.[5] Within this partnership, the ILO will provide technical advisory services, introduce relevant comparative and international experience, and support research and documentation, information exchange, training and

[3] Croatia has joined the EU on 1st July 2013, extending the number of member countries to 28.
[4] An experience sharing conference concluded the project's activities, with speakers from the Swiss Embassy / SECO in Beijing, CNTAC, UNIDO and ILO.
[5] "In close consultation with the Ministry of Human Resources and Social Security (MOHRSS), the All-China Federation of Trade Unions (ACFTU) and the China Enterprise Confederation (CEC) as well as other relevant ministries and civil society organizations (CSOs), it was agreed that the Decent Work Country Programme (DWCP) will provide the framework for the ILO-China partnership over the coming three years (2013 – 2015). This period coincides with the final three years of implementation of China's 12th Five Year Plan, Millennium Development Goals (MDGs) and the Asian Decent Work Decade.

workshops and, where possible, the development and execution of externally funded technical cooperation projects."

ILO's third project-type experience in China is the **SCORE project** (Sustaining Competitive and Responsible Enterprises), for which ILO collaborates closely with SECO, the Swiss Federal Ministry of Economics, one of the two funding sources for this project in China. The Swiss COOP company has joined the project as a private partner, as COOP has operations in China and its management and shareholders are concerned with the working conditions in factories and workshops of its Chinese suppliers.[6]

The SCORE project is a practical training and workplace improvement project, which aims at increasing the productivity of small and medium-sized enterprises (SMEs), while promoting respect for workers' rights. It is a global project, which in its first phase has been implemented in a small number of countries, stretching from Latin America (Colombia) through Africa (Ghana, South Africa) to Asia (India, Indonesia, Vietnam, China). The project demonstrates best international practice in manufacturing and service sectors and helps SMEs to participate in global supply chains. Through the SCORE technical cooperation project, the ILO is assisting government agencies, training organisations, employers' organisations, industry associations and trade unions in emerging economies in Africa, Asia and Latin America to offer SCORE training to enterprises.

SCORE's development objective is that SMEs are more sustainable through being cleaner, more productive and competitive and providing more sustainable and decent employment.

The project is expected to achieve the following outcomes:

Outcome 1: Industry associations can market and coordinate enterprise-upgrading services to their local members.
Outcome 2: Service providers can effectively deliver training and advisory services for workplace upgrading on a commercially sustainable basis.
Outcome 3: Labour inspectorate services work with mass media to disseminate progressive workplace practices.

The first phase of the project started in 2009 and ended in December 2012. It is funded by the Governments of Switzerland (SECO) and Norway (NORAD), with a global amount of USD 8.4 million.

The project is based on the participation of SMEs to a maximum of five training modules covering essential aspects: workplace cooperation, quality management, clean production, human resources, occupational safety and health. Each module is implemented through a

[6] In the 1980s, the ILO engaged directly in TVET, supporting the Ministry of Labour in setting up and running a national Teacher Education and Training Institute in Tianjin. This institution trained and retrained teachers and trainers for the Skilled Worker Schools under the authority of the national Ministry of Labour and provincial Labour Bureaus.

combination of classroom training and on-site enterprise coaching with a minimum of three enterprise visits undertaken by SCORE service providers.

The project has reached a total of 234 SMEs with more than 40.000 workers in the six countries. In China, the project targeted SME's in 3 regions: Dalian (from 2009), Sichuan and Chongqing (from 2011). A total of 23 trainers have been trained. The target SMEs are mainly industrial companies producing machinery and accessories.

The final evaluation of the project, in December 2012, has highlighted the following points, which shed a light on the differences between companies and the specific contexts, within which they are evolving:

1) The primary project counterpart, the China Enterprise Confederation (CEC), has shown strong ownership at the local level (Chongqing, Chengdu and Dalian) where the project is being implemented.
2) However the ownership is uneven, since Dalian was the first place to test the SCORE approach (starting in 2009) and there was some confusion regarding the project objectives and its nature: a training project or a consulting project. As a result, SCORE activities have been at standstill for over one year in Dalian. Japanese-owned companies are prevailing among the target SMEs in Dalian.
3) From a total of six enterprises visited by the evaluators, two have outgrown the SCORE target as they expanded very rapidly and are by now able to pay for targeted consulting services (one in Chengdu – private -, one in Dalian – joint Sino-Japanese -, with 370 employees and 320 employees and both hiring new staff to expand), while another, in Chongqing - experienced a 20% drop in sales and lost 21 staff over the last year, given the economic crisis.
4) Therefore one has to be very cautious not to make generalisations, given the different client base in each location (different mix of state-owned enterprises, private, and joint-ventures), the type of activity, and the level of concentration and competition, as well as the category of the enterprise buyers, and the type of market they are competing in.
5) At the enterprise level, some evidence of improved social dialogue was witnessed by the evaluation, along with clear and meaningful examples of improved labour conditions (one enterprise now applies a 5 day work-week instead of 6 days, more concern about women's jobs in terms of not working night-shifts or doing hard physical work.
6) However at the local level, the tripartite partners (Ministry of Labour, employers, trade unions) had limited knowledge of the project (none in Chongqing, limited in Chengdu, and no tripartite meeting was held in Dalian because of a typhoon emergency warning).
7) There is a potential for extending the SCORE methodology to other supply chains, such as for ABB (ASEA-Brown-Boveri A/B) or BSCI (Business Social Compliance Initiative), based on the Public-Private Partnership experience with the Swiss COOP company.

In terms of project management, China has been one of the most efficient countries among all seven pilot countries, given its comparatively smaller budget and larger areas of coverage, and has gone through the entire package of 5 training modules in the three implementation areas.

Some comments concerning specific SMEs' situations are worth being presented in detail, as they show the diversity of situations:

1) Li Duo Abrasives: Machinery suffers from the global crisis, its sales volume dropped and the company had to reduce its staff. The company reports having that its sales dropped by *only* 10%, thanks to SCORE's support. 20% of SMEs in the same branch of activity have gone bankrupt over the past 2 years. At Li Duo, no worker left since SCORE started.
2) Xidian Cable Co. is in full expansion, looking at doubling production. Xidian cable has outgrown the SCORE target size. Now, the company has 370 employees and considers hiring a consulting firm for their specific needs.
3) The same applies for Fuji Bingshan Vending Machines.
4) Hefeng Machine is in difficulty, given the global crisis. The company lost 21 workers and has difficulty in keeping the workforce, but SCORE's effect on worker-management relations is very positive (green).

After this overview of SMEs in China, seen from the national economic policy perspective and from ILO project perspective, the China case for Apprenticeship will be presented in depth.

3 Apprenticeship in China – an overview

3.1 Introduction and overview

Apprenticeship has been a common feature for centuries, in China and in Europe. It existed mainly in the manual trades, where it was closely linked with the crafts corporations, and in commerce, where it was linked with the traders' guilds. Reports on apprenticeship in China during the Tang and Song Dynasties (618 – 906; (960 – 1279), and under the Ming and Qing Dynasties (1368 – 1644; 1644 – 1911) are plentiful. (cf. Risler 1989, Chapter 3) Apprenticeship was the main avenue for "skills development" in pre-industrial times, but it has subsisted until today in those trades, where the manual competence / skill is particularly important: hair cutting and cooking in the service sector, and masonry, carpentry, electrical wiring / installation and plumbing in the construction industry.

Today, apprenticeship can be found in specific sectors, such as the service sector and the large construction sector. Here it is closely linked with the millions of workers coming from rural areas in middle and western China, and it constitutes an important pathway to qualification and certification, as this public does not have access to the three pillars of the school-based part of the TVET system at the Secondary Education level (Skilled Worker School, Vocational School and Specialized Middle School, intake normally after 6 years of Primary School plus 3 years of Junior High School). One could easily speak of a "dual society" and a "dual economy", a formal and urban one, and a non-formal and rural one, which includes the migrant workers from rural areas in the interior.

Other avenues of training have coexisted with apprenticeship over the history. In pre-industrial times, intellectual education and "training" existed for the preparation of the highly selective exams to become a public official. These were divided in literary exams and military exams, to become a public official either in the general administration, or in the military. The literary exams focussed on literature and history, whereas the military exams contained some technical knowledge, which could be classified as "engineering science and technology", according to European standards.

In Europe, industrialisation relied on a double system of qualifications, composed of skilled workers, who had been trained through apprenticeship, and technicians and engineers, who were trained in the new applied research & development and training institutions. The British model relied heavily on apprenticeship, but also on science and engineering departments such as the Imperial Institute, for training a skilled workforce and engineers for industry and mining, whereas the French model introduced the "Ecole Polytechnique", linking applied research and planning with education and training in all types of technology, a predecessor of the modern engineering schools. But in fact, the French economy relied also on traditional apprenticeship, which subsists until today. The "Ecole Polytechnique" model was copied in some German states, but also in Northern Italy, as a result of Napoleon's modernisation agenda at the beginning of the 19th Century, built upon the progressive elements of the French Revolution. It became the pathway to higher technician and engineering positions, whereas

modernised apprenticeship was, and still is, the main pathway to middle-level skilled worker positions in a number of countries.

In China, similar higher educational institutions appeared with the "Self-strengthening movement" in the late decades of the 19th Century, when political and military leaders as Li Hongzhang (1823 - 1901, Governor of the Canton area, today Guangdong Province) and Zhang Zhidong (1837 – 1909, Governor of the Wuhan area, today Hubei and Hunan Provinces) set up heavy industry with coal mines, steel works, ship wharfs, railways, and manufacturing workshops for the production of armaments. The self-strengthening movement followed the objective of evicting the foreign powers from China by force, with military means. This objective was partially achieved with the end of the Chinese empire, whereas the industrial basis reached only a rather embryonic stage.

In China, apprenticeship has never been specifically supported since the foundation of the People's Republic of China in 1949. However, it has subsisted as one of the training avenues leading to employment, mainly in the construction industry, in small production and repair workshops and in the traditional service trades, such as hair cutting and cooking.

In industry, the preference was given to schools on the upper secondary school level and the higher education level:

- The Skilled Workers' Schools within factories, the Specialised Middle Schools within Branch Administrations, such as Electrical Industry Administration, Transport Sector Administration etc. the Vocational Middle Schools as part of the Education system – on the upper secondary school level
- The Specialized Higher Schools or Institutes as part of the same Sector Administrations and Vocational Colleges, usually combining theoretical instruction with practical training and work practice (see below, chapter 2).

At least the Skilled Workers' Schools, the Specialised Middle Schools, and the post-secondary Specialised Institutes were closely linked with factories and sector administrations, allowing for a smooth transition from training to work.

The Labour Administration was in charge of regulating apprenticeship, as apprentices fall under the labour laws and apprenticeship is formalised by a specific contract similar to a work contract.

In the middle of the 1980s, apprenticeship was not specifically considered, as the Government laid down its policy of "first train – then employ", with the purpose of rationalising the large economic and social conglomerates and redefining institutions, factories and other types of economic and social entities. Production and service units ceded to care for training, as they moved from the notion of "large and complete" to a business model governed by the "modern" notions of recurrent cost and benefit. So, housing, welfare including health, and education and training, were separated and externalised from the production and service units, which turned themselves into single-purpose production or service companies.

A specific feature appeared in the middle of the 1980s, when the qualification levels within the production and service units (companies) were re-established. At this time, older workers were put on retirement, and young workers were recruited to replace them, in most cases without preceding training off- or on-the-job. This process was called "ding ti" for replacement. In many companies, the older workers transmitted their practical skills to the young new workers. But the same factory or service company could run a Skilled Workers' School, thus being in a position to ensure a rather solid and complete training with a good part of practice (a sort of home-grown "dual system" of training).

Today, apprenticeship is still present, it can be observed in barber's shops, in restaurants (cooks) and on the construction sites, There it coincides with the fact that nearly all construction workers are coming in bulks from the countryside or small towns in the middle and western regions (provinces) of China. So they have, as a rule, not had the opportunity of going to a vocational school specialised for the construction trades.

It is extremely difficult to quantify the numbers of apprentices today. But as barber's shops, restaurants and construction sites exist all over the country and in every place, one can assume that there must be millions of apprentices.

Speaking of apprentices is one thing, classifying apprenticeship in "formal" and "informal", or "modern" and "traditional" is another thing. Indicators for discerning the two can be:

1) The existence of a work contract or an apprenticeship contract
2) The payment of pocket money or a percentage of a full wage
3) The existence of a master craftsperson who oversees the learning process of the apprentice
4) A sequence of learning phases and work tasks, which allow for an organised learning process.

3.2 Apprenticeship within the TVET-employment relation from 1949 to today

A recent doctoral dissertation written by a Chinese research student, traces the lines of apprenticeship and school-based technical and vocational education from the first countrywide industrialisation phase in the 1950s until today. (Junlan 2013)[7] The author divides this overall period of time into three phases:

1) The build-up phase from 1949 to the opening-up of China with the "4 Modernisations" starting in 1978-79 (Modernisation of Agriculture, Industry, National Defence, and Science and Technology)
2) The transition phase from 1978-79 to the beginning 1990s
3) The consolidation and internationalisation phase from the beginning 1990s until today

It is worthwhile following this way to understand the mindset of decision makers, who are responding to political, economic and social pressures, when they decree the many policy

[7] Guiding professor: Prof. Dr. Zhao Zhiqun, Peking Normal University. Chapter 7: Research on Legitimacy. The research work includes the author's empirical study with interviews in companies and a large Skilled Worker School in Guangzhou (Canton)

changes. But one decisive part is missing or at least not visible in this process: the voice of the users of skilled workers and employees, their needs, their preferences and their own remedial actions, if they cannot obtain what they need.

Phase 1: From 1949 to the Opening-up period 1978-79

After the victory of the Chinese Communist Party over the Kuomintang in the civil war following the end of the Second World War (1945 – 1949), China went through a phase of rapid and large-scale industrialisation, from mining through heavy industry to light industry and distribution, and the outlay of a countrywide transport infrastructure, mainly relying on an extensive railway network, as well as river and coastal transport by ship.

The Soviet Union and the Eastern European countries, members of the Soviet Bloc, supported China heavily during the construction period 1950-1958, establishing mining and production complexes, engineering faculties, technical schools and training centres, and shaping the first large corps of Chinese engineers and workers.

Until 1959, apprenticeship at the production workplace was the major source for new skilled workers, apart from the large industrial complexes, which had their own schools and institutes training skilled workers, technicians and even engineers. In the same decade, the Skilled Worker Schools expanded from 23.000 trainees in 3 schools in 1950 to 515.000 trainees in 2.179 schools in 1959. Short-term measures were added to complement these two pathways, in order to train millions of new workers for industry.

In 1957, the State Council (the Government under Communist Party leadership) proclaimed a regulation, intending to formalise apprenticeship:[8]

1) The duration should be 3 years; it could be shorter for simpler trades, but not less than 2 years, and longer for complex vocations.
2) The minimum age for recruitment was fixed at 16 years, but it could be lower for specific traditional trades.
3) The apprenticeship allowance could be lower than a workers' monthly wage.

The regulation took into account some points of criticism towards apprenticeship:

1) The apprentices missed the capacity of working autonomously;
2) The apprenticeship allowance was considered as being too high;
3) The entry level of the graduates in the salary scale was too high and their progress to higher salary levels was too fast. This created conflicts with the other workers and had as result that many companies avoided to recruit apprentices.

[8] State Council Regulation concerning the apprenticeship duration and allowance of state-owned, joint public-private, cooperative and private companies and business units, 1957

Phase 2: From 1978-79 to the beginning 1990s

In 1980, there were probably 5 – 6 times more apprentices than students in Skilled Workers Schools, and still more than the overall number of students in the three types of TVET schools together.[9] At that time, apprenticeship corresponded well with the conditions of the country:

1) A large population, a backward economy, an urgent need of skilled workers. So it was by far not sufficient to rely only on the small number of graduates trained by the Skilled Workers School.
2) In the companies, there were many different vocational trades and specialisations, for which the schools did not train. So, apprenticeship could fill the gap.
3) Apprenticeship is very efficient for acquiring manual skills, for good quality manual work.
4) The apprentices constitute a "reserve army" for skilled workers.

However, some difficulties have been noted at the time:[10]

1) Apprentices satisfy only the requirements of the company or factory, where they are working. Their competences are not transferable.
2) The quality of apprentice training is being challenged: The requirements are rising with the pace of economic and scientific-technological development.
    a) Apprentices are getting used to the "iron rice bowl" (the guarantee of life-long employment), because they expect life-term employment. So they are not eager to learn. This has also a negative influence on Skilled Worker Schools, Vocational Middle Schools and short-term training courses.
    b) The companies and factories are not able to instil the political, cultural and technical-vocational knowledge and values. Therefore, they do not succeed in laying a scientific basis to the training of manual production competence.
    c) The training mode of apprenticeship cannot satisfy the needs of developing and improving products and production processes.
    d) New workers are recruited through the work-contract system, whereas apprentices enter the old lifetime employment system. If this continues, it will create new conflicts.

As an answer to the upturning problems, the State Central Labour Office (1981) proclaimed a policy guideline, entitled "Ideas concerning strengthening and reforming Apprenticeship work", addressing apprentice recruitment, duration, training objectives, training mode, contract and examination.

[9] "In 1983, there were an estimated 2 million apprentices in industry, the construction and transport sectors – not counting the commercial and service sectors. … In comparison only approx. 700 000 pupils attended the Skilled Worker Training Schools in the same year." (Zhongguo baike nianjjian 中国百科年鉴 (China Yearbook) (1984), quoted from: Münch, J. / Risler, M. (1985))

[10] Gu Fangrong, in China Labour 1988

The document highlighted 4 key aspects for improving apprenticeship:

1) Improve apprenticeship by defining rules for accepting and rejecting apprentices.
2) Ensure an overall development, which includes moral, knowledge and physical development, and which targets the following series of objectives: the political objective, the moral and intellectual objective, the knowledge objective, the competence objective.
3) Improve the quality of training through a clearer definition of the training mode, in 4 aspects:
   a) The training contract needs to include the obligations of both company and apprentice. The labour administration is in charge of supervision and control.
   b) Stipulate the training duration, normally 3 years, for simpler occupations not less than 2 years.
   c) Choose a diversified and flexible training mode, including time for acquiring theoretical technical knowledge, define requirements concerning the masters, the rotation of work places and the availability of a specific training area or a training centre, avoid the monotony of work etc.
   d) Strengthen leadership and management.
4) Improve the quality by assessments and exams.

At that time, the Skilled Worker Schools functioned in parallel with Apprenticeship, and students having graduated from these schools were obliged, once they had graduated, to go first through an apprenticeship period in the employing company or institution, before being integrated as regular skilled workers.

One interview partner of the Chinese doctor thesis author describes his own experience in a lively way:

> *"In our time in the Skilled Worker School, we did "half-work half-study": For our practice, we went to the workshop, we worked following a master. At that time, the apprenticeship system combined the Skilled Worker School with the company in a dual system for "raising talents". Therefore, the graduates from the Skilled Worker School did not have to go through apprenticeship, when they started working." He himself entered a skilled worker school in 1978, and as he graduated in 1980, he was immediately classified as a second level worker, with a monthly salary of 54 Y RMB. "Our training was already of higher quality than the traditional apprenticeship only at the workplace. Not only we had acquired the capacity of working autonomously, but we were also able to resolve problems in the production."*

So, a sort of „Dual System" was introduced and it worked efficiently, where the links with the companies and the work places existed.

Another interview partner explains:

> *"In 1985, 1986, the companies needed large quantities of new skilled workers. Many companies had acquired new technologies, production tools and materials, so a big*

change happened, comparing with the China in the 1970s and before. The old masters, the old workers were no more able to adapt to these changes. It became evident: To resolve these questions, one could only rely on the Skilled Workers Schools and Colleges."

Later on, in the period from the mid-1980s to the beginning 1990s, the government introduced gradually the "first train, then employ" policy, using (school-based) technical and vocational education to replace the apprenticeship system.

In 1985, the Central Committee of the Chinese Communist Party proclaimed the *"Decision on the reform of the education system":* In each trade or vocation with a technical grading examination or certification, a "double certificate" system was to be introduced gradually. Each graduate would obtain simultaneously the graduation certificate (i.e. the education diploma) and the "technical grading certificate" or "workplace compliance certificate" (i.e. the vocational diploma). (CCCCP 1985)

Another interview partner of the research student explains:

"In the later part of the 1980s, the (Skilled Worker) Schools began to have a voice. Before they were not heard; they had to follow the government, the companies, the branch organizations, the industry bureau etc. Between 1986 and 1990, the (autonomously-run) Light Industry School (in Canton) expanded from 6 classes with 300 trainees (1986) to more than 1.000 trainees (1990), and its status had risen to the provincial level.

So, the school had acquired a big voice, the school said: Our resources are insufficient, class rooms, teachers, practical training sites, equipment etc., and the school asked the government for financial support. The school claimed that the classes, which were spread over several companies, were united in one place. Otherwise, how was it possible to organize "half-work half-study" in the companies? Who would go for control? Who would give the guidance?

In this period, the Skilled Worker Schools were completely transferred (from the companies and branches) to the territorial administration (municipal labour bureaux), and they asked to be authorized to run the school by themselves."

Over the period from 1985 to 1990, the Skilled Worker Schools expanded from 639.000 students (1985) to 1.33 million (1990), so the number of students doubled. Another five years later, in 1995, the total number reached 1.885 million students, i.e. three times that of 1985.

It is worth while paying attention to the rapid increase in the number of trainees: Increasing the number of students bears the risk that students will not have the time, which is necessary for acquiring manual skills and for learning precision and quality work. They may only assist, when technical specificities are demonstrated, instead of really practicing themselves, with adequate work tasks and with a tight control of their work methods and their products. It is crucial that the learning process is structured and well organized. By overloading the schools,

the classes and the learner groups, one falls back to teaching only, without guided and structured practice learning, with monitors and masters in the companies. Without this, one loses even the advantages of the "workplace apprenticeship", which the Skilled Worker Schools were supposed to replace and overtake. This concern has not found a response in the doctoral thesis.

The interview partners of the research student commented, that:

1) *"Apprenticeship corresponds with life-long employment; very rarely somebody is dismissed; the human resources do not flow."*
2) *The factories practice their own examination system and their own qualification ladder.*
3) *"The company issues the technical skills level certificate. An example from the Canton area: The Light Industry Concern has 8 big factories, each one classifies on its own, the standard requirements for a mechanic in the paper factory are different from a mechanic in the sugar factory, with the result that the worker cannot move from the paper factory to the sugar factory. So there is no flexibility."*

The author of the doctoral dissertation concludes that the apprenticeship system led to life-time employment, whereas the companies were turning to the labour contract system, with free hiring and firing and the dismissal of millions of unskilled, semiskilled and skilled workers and employees. The apprenticeship system did not correspond with the new work contract system, and the two employment systems were in contradiction and conflict with each other.

However, a simple look at apprenticeship systems in other countries shows that it is possible and current practice that companies:

1) are not obliged to employ the graduates after the end of their apprenticeship;
2) can take in more apprentices than they need for later employment;
3) can lower their salary costs by employing several apprentices instead of recruiting skilled workers and employees, who would be much more expensive for them…

Solutions may also vary widely between trades. The most costly training is in mechanical-electrical and electronic trades, with mechatronics probably being among the most expensive trades, whereas other trades may have very limited marginal cost.

Phase 3: From the beginning 1990s to today

Upon the end of the Transition Period from 1978-79 to the beginning 1990s, the Ministry of Labour issued in 1992 a new policy document, which confirmed the move towards school-based TVET, the *"Decision of the State Council concerning the vigorous development of technical and vocational education"* (the "and training" is missing, so only TVE is considered).

The "Decision" stressed the need to improve the apprenticeship training. Apart from traditional arts and crafts and a small number of special trades or vocations, all other trades or

vocations must in the future switch from recruiting apprentices to preparing trainees for specific jobs. With the new policy of „first train then employ", the apprenticeship system has lost its legal status. So everybody, who wants to find employment, has to go before through training, in order to obtain the vocation or trade certificate. This has contributed to the rapid growth of Technical and Vocational Education.

The "Decision" announced 3 reform measures:

1) Reinforce the building of training bases, develop the existing Skilled Worker Schools' Vocational Training Centres, and the "training bases" of the "Labour Service Companies".[11] On the basis of the existing schools, open the scale of organizing education / schools, and improve the conditions of managing education / schools;
2) "*Prevent and impede that companies recruit apprentices.* Branches and vocations with relatively high technological requirements and large and medium-sized companies in relative advanced regions can first conduct trial-runs or pilots."
3) "When these regions and branches recruit new skilled workers, they organise exams among the graduates from Skilled Workers Schools and Vocational Schools and engage the best, *instead of recruiting apprentices anymore*." As a result, the Skilled Worker Schools do not feel themselves subordinated to the branches and companies.

With the economic reform process entering all levels of institutions and organizations, including companies, cost considerations brought companies to cut off and transfer non-productive units, such as schools, hospitals and health stations, support services etc. Whole branches disappeared, unemployment, in the past dissimulated behind window-dressing terms (daiye 待业 = "waiting for work"), became an accepted term, but also a cause for social unrest.

In the middle of the 1990s, the economy was heating up, the inflation rose to unknown levels (1994: 24,1 %, 1996: 8,3 %). However, the government under Prime Minister Zhu Rongji managed to cool down the economy, resulting in a more sustainable growth rate and the return of inflation to rather tolerable levels.

The figures underscore the new phenomenon of unemployment: In the year 1997, 21.15 million people were registered as unemployed. In the six years between 1997 and 2003, 37.4 million workers and employees lost their jobs, and only around 1/3 found a new employment. The term "structural unemployment" became part of the common vocabulary. It is the unqualified and semi-qualified, who face the biggest difficulties in finding a new job.

As a consequence, for the first time the notions of quality and qualification entered the reflections of policy planners and operational managers.

The employment system changed from the 8-grades technical workers scale to a qualification ladder. In a first stage, it comprised three grades:

[11] Quoted from a Conference on the Reform of the Apprenticeship System, in Beijing Adult Education (in Chinese) Beijing chengren jiaoyu, 1989 (3), 5

1) Initial level technical worker
2) Middle level technical worker
3) High-level technical worker.

But rapidly it appeared that even a sort of master or technologist was necessary and missing. So, two additional grades were added on top of the first three:

4) Technologist or master
5) High-level technologist or high-level master.

From this resulted the new 5-grades qualification scale.

What is not evident from the literature is, how the competences are measured and which competences are regarded as being the most needed at the work place in the enterprises.

Throughout this third phase, from the mid-1990s until today, apprenticeship continues to exist as a *non-formal* way of education and training, on the countryside and in the cities. With the abolition of *formal* apprenticeship, the vocational schools developed fast.

However, as the school side is called upon to take the lead, and as the enterprises are seen as the less active part, one has to doubt about the feasibility and effectiveness of this policy.

Over the course of the 1990s and in the first decade of 2000, China became the "global workshop". The complexity and technological precision of production was rising continuously. This posed new challenges for the availability, recruitment and training of highly qualified workers. The competence requirements became higher and higher. This meant that a competence – and skills - testing and certification system had to be created. In the past, trade testing and certification had been done within the factories and companies. But now the need appeared to externalize testing and certification to more independent or less-dependent bodies (from 1994 onwards).

The available literature, including the doctoral dissertation, the field visits and the interviews did not shed sufficient light at this crucial area. So there is no precise perception of the differentiation between different trades and vocations and the solidity of the highly skilled worker, technologist and "master" level.

In this situation, two solutions were conceivable to improve the quality of apprenticeship and to integrate it into the pathways towards employment:

1) Reform the competence certification system of apprenticeship;
2) Integrate school practice and theory teaching and learning in the apprenticeship system, in order to increase the quality of "building talents".

The Communist Party leadership and the government became aware of the serious lack of qualified and highly qualified workers, which risked impeding the necessary adaptation of the present productive system to the technological progress. In 1998, the Ministry of Labour issued a communication "*Concerning the establishment and management of the training mode 'master guides apprentice'"* (mingshi daitu 明师带徒). This initiative was thought to increase

the proportion of highly skilled talents among the skilled workers, in order to create a solid contingent of technologists and high level technologists, whose skills are "approaching perfection" (jingzhan 精湛) and comply with the high competences needed for the adaptation of the productive system and the technological progress.

The Communication stipulated that: "until the end of the 1990s,

a) The proportion of highly skilled workers among the skilled workers must increase from 3,5 % to 4 – 4,5 %, and it must reach or exceed 6 % of the whole number of skilled workers;
b) The proportion of technologists (masters) and high level technologists among the highly skilled workers must increase from 20 % to 30 and reach around 1.4 million until 2010."

The "Communication" responded to two problems:

1) The old apprenticeship had already been replaced by the vocational school education; it had lost its official recognition ("legal status").
2) The renewed recognition of the value of apprenticeship, the restoration and implementation focus on the production of highly skilled talents was recognised as a priority need. But as this need was not sufficiently taken for serious and as there was no general reaction (or support) from society, the interpretation of "school cooperates with company" puts the school in the guiding position. The companies see that apprenticeship is not the general standard, each company has to count and to live on its own, the local "social environment" is not conducive etc.

The new *"master guides apprentice"* is different from the apprenticeship system at the workplace in two regards:

1) The levels for which the apprenticeship trains, are different: Now, the new *"master guides apprentice"* scheme has to train highly skilled workers, technologists and high level technologists. The method is to use those, who are already highly qualified, to train the new high level workers. This is an improvement compared with the traditional apprenticeship.
2) The aims of training are not the same: The new scheme *"master guides apprentice"* is supposed to evaluate and certify workers who have a high competence, but which is non-formal (i.e. acquired by experience). Evaluation and certification have to be transferred to social bodies outside the enterprise.

Unfortunately, as this initiative was little publicised, it did not reach the company managers having initiative and disposing of resources to match and '"buy in" the Ministry of Labour's offer. The initiative was phased out, before being deployed on a measurable scale. So, the perception of apprenticeship training has not changed (= improved) significantly. The numbers of apprentices in the new scheme were still small and by far did not reach the numbers of students in Vocational Colleges at the Higher Education level.

A parallel development reduced even more the interest of the public towards apprenticeship:

The economist Yang Min recommended to the Central Committee to multiply the current intake of universities and other Higher Education institutions. He gave 3 reasons:

1) Because of the large number of dismissed workers, the labour market is overloaded and these people will compete with the young school leavers. This is causing conflicts. Adding 3 to 5 years of education at the Higher Education level will ease unemployment and avoid conflict.
2) The government has proclaimed an objective of GDP growth of 8 % per year, and the population considers education as the highest need. Expanding Higher Education will allow buying in popular support, as parents consider Higher Education as prestigious for themselves and for their children.
3) Increased enrolment in Higher Education can increase the internal demand and drive growth. A better educated population will increase consumption in the future.

From 1999 onwards, annual enrolment in Higher Education increased by 513.200 to 1.6 million, and in 2003, the total number of students in Higher Education exceeded 10 million students. The opening up of enrolment in Higher Education has had an immediate effect on the relative weight of TVET and general education at the secondary education level. The share of TVET in secondary education decreased from slightly above 50 % in 2000 to only 38.6 % in 2004.

It can be asked, whether the rapid development of university education was wise and forward looking, and whether it resolves the shortage of highly skilled workers in the companies. It is well known and publicised, that 2/3 of the Higher Education graduates does not find an employment. However, this general figure has to be differentiated: The graduates from Higher Vocational Education still have a relatively high chance of finding a corresponding employment (80 %), not so far away from the 90 % employment chance of graduates from the Senior High School level of TVET.

In 2005, the State Council issued the *"Decision of the State Council to vigorously develop vocational education"*. It promoted the "talents raising model" of *"combine work and study, link school and company"*. As a result, TVET at the Senor High School level increased again at a fast pace。 From 2005 to 2010, the vocational education part has climbed up again, from its deepest point, to 47 %.

The cooperative model involving schools and companies in multiple forms was revived, despite its low level of definition and rigour. This principle is becoming the central concept for the management of vocational education and TVET in general. On this basis, a new start is searched for the cooperation between school and enterprise. However, one can doubt about its chances to promote "modernised apprenticeship", as the Chinese author of the doctor thesis assumes.

According to the Ministry of Education's policy, the companies are only the "junior partner". They are asked to make available part-time teachers and practical training sites and equipment. This has led to the situation that in the cooperation between school and enterprise "one head is hot, the other is cold". One can ask: What is the interest for companies of joining this uneven alliance?

At the same time, in many other countries Apprenticeship has been called to new life. The Ministry of Education has noticed this tendency and mentions among its priority work topics, the start-up of trial work for a modernised apprenticeship. Apprenticeship is called to complete the TVET system; it is considered an important pathway to increase the quality of education and the level of "talents". But no efforts are made to promote modern apprenticeship with all its minimal constitutive elements among the core subjects of action, the companies.

Summarising the history of apprenticeship during the third phase from the mid-1990s until today, one can differentiate two stages:

1) From the mid-1990s to 2004, the abolition and (partial) restoration of apprenticeship with the *"famous master guides apprentice"* mode, in order to fill the gap of highly skilled workers, technologists and masters;
2) From 2005 to today, the integration of apprenticeship – and its dilution - in the multiple forms of "cooperation" between school and company.

3.3 Some conclusions and questions arising from the historical review

The historical review suggests the following critical conclusions:

1) The need for highly skilled labour has clearly been detected. A part of the Chinese economy is moving up to a more sophisticated model, which requires a strong core group of well skilled workers, who are able to go with or even guide the innovation process.
2) The need of cohesion and smooth collaboration between the skilled workers in the production process on one side and the engineers in workshop management, production planning and in research and development on the other side, is not mentioned – and not conceived - at all.
3) The notions of quality products and services and of competences and skills are not filled with a specific content and they are not differentiated for different sectors, trades and vocations. So it is difficult to see, whether and how innovation can come in and transform production processes and enterprise structures.
4) Apprenticeship as a mode of workplace-based learning is still present, but it has lost - or not found yet - its productive and innovative role in the context of modern industry. The new model of a Chinese version of "dual learning" has been tested in the alliance between Skilled Worker Schools and training with a mentor or master in the workshop, apparently with good results. However, with this model, the apprentice risks to be a mere student or learner, s/he is prevented from acquiring the status of a worker, and therefore, the "appropriation" from the side of the company, the employer is lost. The

chance of involving the company management, the production managers and human resources managers is not seen and not used. What is wrong about giving the companies the lead?

5) School-enterprise cooperation as a concept is too vague to form one mainstream and one type of learning, with its human resources and financial implications. It is too vague, and if the school side takes the lead, the enterprise side will be less active, its resources and its initiative remain unexploited, which is a big loss for economic development, employment, and for up-scaling the added-value of the Chinese part in the overall value chain of products and services.

The questions, which arise, but which are not answered, are:

1) Who are the Chinese companies (their managers, their supervising bodies), what kind of skills do they need and what are they willing to contribute?
2) Are they interested in aggregating their efforts, in order to speak up with one voice?
3) Which type of "umbrella" organisation would be wide enough, but also influential enough to function as a speaker? Even developing countries at a lower overall level than China have strong employer organisations with considerable political clout (FEC in the Congo, UMA in Uganda, SNI in Peru).
4) Is it conceivable that the existing branch associations assume this role? How can they be reinforced? How about their financial means? Or is there a need and a justification for regional Chambers of Commerce and Industry, which would also assume a role in skills development / human resources development?
5) Which are the services, such a strong organisation would have to provide, in order to build up, support and monitor a TVET system or at least a sub-system, which would be close to the companies' needs and wishes?
6) How to articulate the different levels of qualified staff within companies? How to train highly skilled workers and employees and how to benefit from the potentials of "dual studies" at the Higher Education level?

4 The TVET system and the employment system

4.1 The “official” TVET system

For the subject of Apprenticeship, one could say, just limit the case study on apprenticeship in China to it and leave aside the school-based TVET. However, if we want to reach conclusions on how to improve the existing apprenticeship and how to build “modern apprenticeship”, we need to understand the whole TVET system, pre- and in-service, secondary education level and higher education level, school-based, workplace-based, cooperative forms, and finally “The Chinese Dual System”, which is certainly neither a Danish, a German, an Austrian, a Swiss apprenticeship system, nor a British or Australian one. We can even include the French case which favours school education over all, but which preserves apprenticeship in a specific niche, but opens it towards higher education at the Bachelor and even Master level.
The most important shortcoming of the present case study is that the voice of the company managers and board members has not been heard, or only to a very marginal degree. The same is the case with the Chinese doctor dissertation on apprenticeship, which facilitated the approach, but remained at the surface of problems and ways forward.

In China today, TVET exists on the secondary education level and on the tertiary education level.

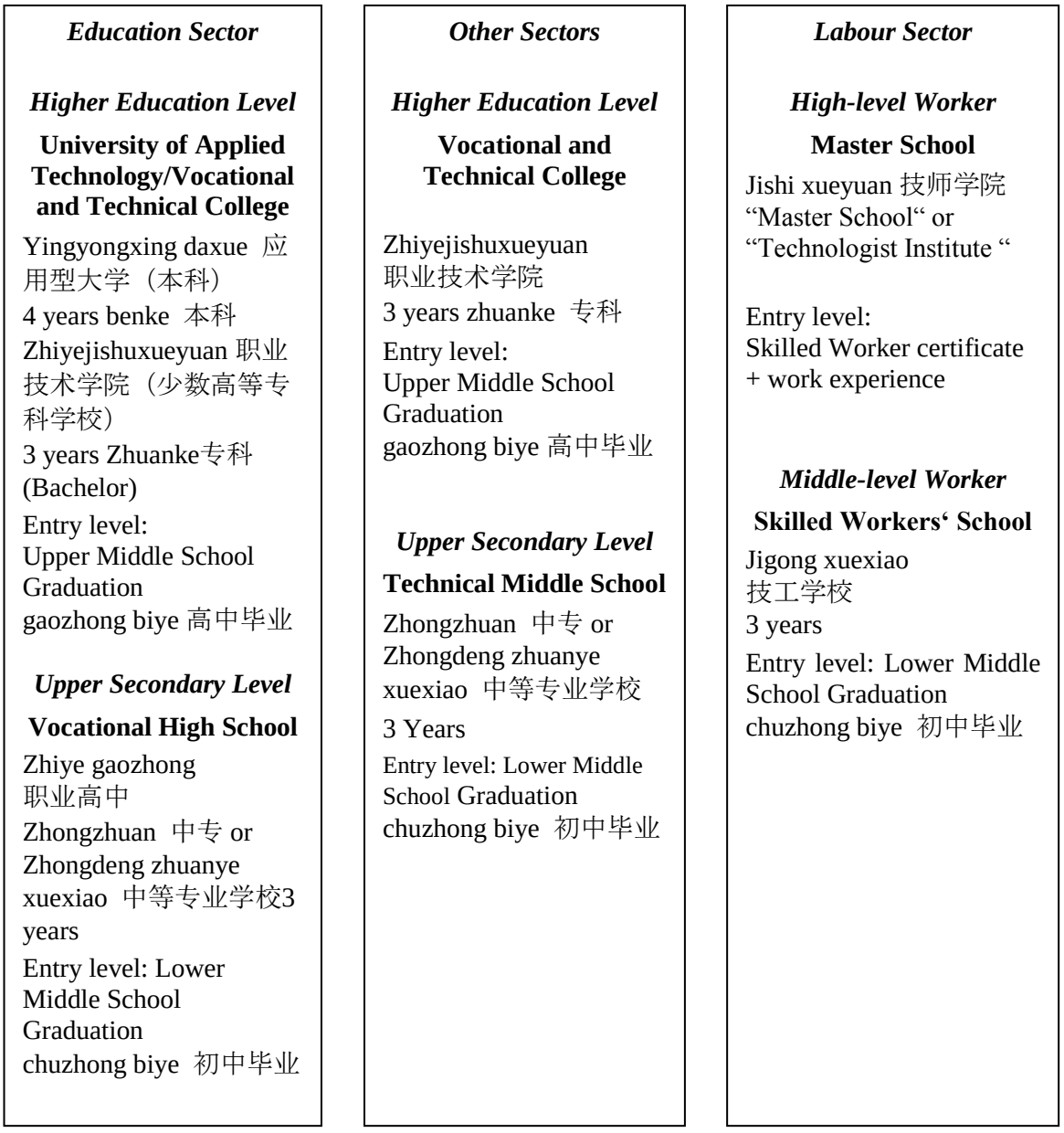

Figure 1: Institutions in China at Secondary Education and Higher Education Level

Informed observers estimate, to give a rapid overview, that:

1) at the Secondary Education level, 50 % of students take the general education pathway, and the other 50 % take a TVET pathway.
2) at the Higher Education level, 50 % of students take the full university studies pathway (benke 本科), and the other 50 % take the vocational studies (zhuanke 专科) pathway.

Apprenticeship is not mentioned at all, which does not mean that it does not exist. But it is not categorised as such. So we deal with it in a separate and "qualitative" way, as quantitative data are not available directly, at least not in the period when this report was produced.

Regarding the available official statistics closely, one discovers some variations to the observers' overall description:

1) On the Upper (Senior) Secondary Education level, 8.5 million Junior Middle School graduates opted in 2012 for the General Upper Middle School, and 8.1 million for the three vocational education pathways: 3 million for the Regular Specialised Middle Schools, 2.5 million for the Vocational High Schools and 1.6 million for the Skilled Worker Schools.
2) On the Lower (Junior) Education level, there is only a very small number of pupils in Vocational Education, 25.000 altogether. This means that most of the pupils having completed Primary Education enter the lower segment of secondary education via the general Lower Middle Schools. So the first important differentiation happens only at the age of 15, with the end of the 9-year compulsory education.
3) On the Higher Education level, vocational education has a place in the Undergraduate segment. In 2012, 3.25 million secondary school leavers opted for a vocational stream (the Specialised Higher Education (zhuanke 专科, usually 3 years long), and 3.6 million for the general stream (benke 本科), which leads throughout 4 years of study directly to the Bachelor's degree, whereas the vocational stream is thought to prepare for a job in the labour market.

One more figure is important to keep in mind: around 7 million graduates leave the universities and other Higher Education Institutions every year. But only 1/3 of them find a suitable employment corresponding with their field of studies.

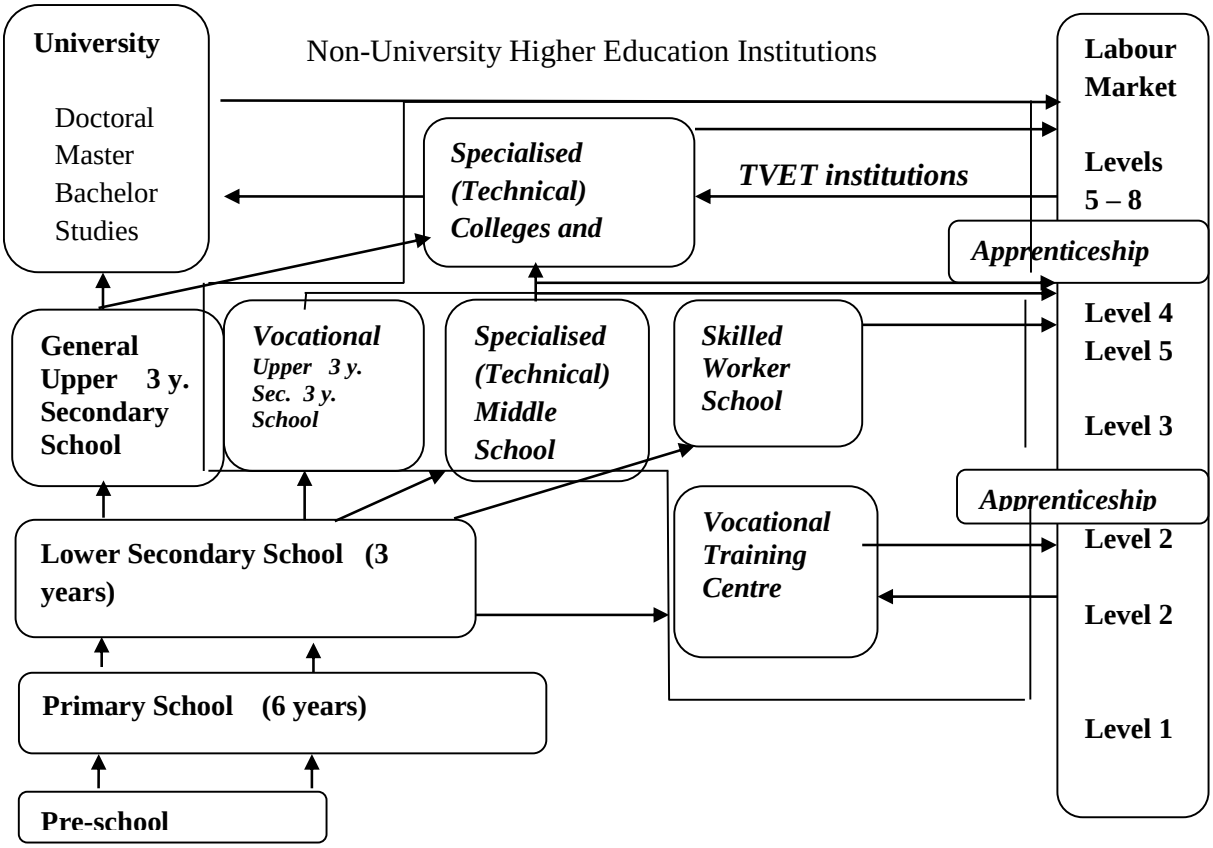

Figure 2: Main elements of the Chinese Education-Training Employment system

Table 4: Pupils and Students in General Education versus Technical and Vocational Education Training (2012)

Higher Education level

		Graduates 毕业生数（人）	Admissions 招生数（人）	Total enrolled 在校生数（人）
1	Postgraduates 研究生	429 994	560 168	1 645 845
1.1	Doctor's degree 博士	50 289	65 559	271 261
1.2	Master's degree 硕士	379 705	494 609	1 374 584
2	Undergraduates in Regular HEIs 普通本专科	6 081 565	6 815 009	23 085 078
2.1	Normal courses 本科	2 796 229	3 566 411	13 496 577
2.2	***Special courses 专科 = TVET***	***3 285 336***	***3 248 598***	***9 588 501***
3	Undergraduates in Adult HEIs 成人本专科	1 906 640	2 185 141	5 474 962
3.1	Normal courses 本科	755 402	897 241	2 336 132
3.2	***Special courses 专科 = TVET***	***1 151 238***	***1 287 900***	***3 138 830***

Secondary Education level

	Senior Secondary Education 高中阶段教育	14 502 827	16 646 463	98 078 540
1	Senior Secondary Schools 高中	8 099 367	8 507 799	24 812 760
2	Secondary Vocational Schools 中等职业教育	6 603 460	8 138 664	11 053 300
2.1	***Regular Specialised Secondary Schools 普通中专 = TVET***	***2 702302***	***2 995 725***	***8 552 071***
2.2	***Adult Specialised Secondary Schools 成人中专 = TVET***	***530 942***	***1 039 639***	***2 387 275***
2.3	***Vocational High Schools 职业高中 =TVET***	***2 178 008***	***2 464 262***	***6 809 722***
2.4	***Skilled Workers Schools 技工学校 =TVET***	***1 192 208***	***1 639 038***	***4 304 232***

	Junior Secondary Education 初中阶段教育	17 963 135	16 347 296	51 212 480
1	Regular Junior Secondary Schools 初中	17 366 786	16 347 296	37 697 057
1.1	Junior Secondary Schools 初级中学	13 097 178	12 079 662	37 697 057
2	***Junior Vocational Schools 职业初中 = TVET***	***11 823***	***7 208***	***25 966***
3	Adult Junior Secondary Schools	596 349		544 456

Note: TVET components are highlighted with green colour.
Source: Ministry of Education of the People's Republic of China (2013)

Now we want to describe the different schools and colleges in more detail, in order to mark the specific focus of each one:

Secondary Education level

The three types of TVET schools at the Upper Secondary ("High School", "Upper Middle School") level:

1) **Technical Middle Schools** (zhongzhuan 中专 or zhongdeng zhuanye xuexiao 中等专业学校)

They belong often to a sector administration (such as: transport and communications, water and electricity distribution, chemical industry), often at the provincial level, and they offer vocational subjects linked with administration and technology. The graduates are often called "technicians". Usually, they do not work on a production line, but plan, organise, administer, are in charge of quality control etc.

2) **Vocational Upper Middle School** (zhiye gaozhong 职业高中)

These schools belong directly to the school system and have their origin in the transformation of General Secondary Schools into Vocational Secondary Schools. They can prepare for industrial and service occupations. Usually, they have established a partnership relation or several partnership relations with companies and other employers. These employers may open a production workshop or a service office within the school premises or nearby. The type of production and service may change over time, according to the needs and motivation of the partners. There are 270 vocational specialities (vocations) nationally, grouped in 13 branches.[12] (OECD 2010)

[12] 1) Agriculture and forestation 2) Resource and environment 3) Energy 4) Civil works and hydraulic engineering 5) Manufacture 6) Transportation 7) Information technology 8) Medicine and health 9) Business, trade and tourism 10) Finance and economics 11) Culture, arts and sports 12) Social and public affairs 13) Others.

3) **Skilled Worker School** (Jigong xuexiao 技工学校)

The skilled worker schools "produce" workers for industry. In the past they belonged to large or medium-sized factories and provided theoretical and practical training in a close combination. Or they give only the theoretical part of instruction, whereas the practical part is acquired on the job in the factory workshops. Nowadays, skilled worker schools belong in many cases to the labour administration at the city level, because the factories became autonomous financial entities, which feel the need to curb their non-productive costs. Once the school has left the factory, it can organise partnerships with several companies in its area. The graduates become first-line production and service workers.

All education and training programmes at the secondary education level have a standard duration of 3 years. In many cases, 2 years of school are followed by one year in a partner company. But this is not equivalent with apprenticeship: there is no contract, no obligatory payment, although a pocket money might be paid, and the training between the school and the company is not systematically linked with each other.

Having apprenticeship in mind, it is the Skilled Worker School, which comes closest to the purpose of apprenticeship.

Higher education level

Here we can differentiate two types of TVET institutions:

- The "dazhuan" or "gaodeng zhuanke xuexiao", often called "xueyuan", which in English is "Institute" instead of "School" for the corresponding secondary education level institution, and
- The "Vocational College" or "Vocational University"

Both can be considered as parts of the overall TVET system.

4) **Higher Institute, Vocational / Technical College** (Dazhuan 大专, xxx xueyuan 学院)

These Higher Institutes or Colleges take in Senior Secondary School graduates, who have participated in the national "gaokao" or Higher Education exam.

The graduates are always considered as "technicians". But this is only the denomination of their diploma, whereas in the company or institution, which recruits them, they can be either workers (5-grade workers hierarchy) or technical staff.

5) **Vocational College, Vocational University** (Zhiye daxue 职业大学)

The second type of institution is the Higher Education correspondent to the *Vocational (Upper) Middle Schoo*l, in the same way as the *Higher* Institute (dazhuan) is the Higher Education correspondent to the *Technical Middle School "zhongzhuan".*

In practice, the differentiation between *Higher Institute (dazhuan)* and *Vocational College* or *Vocational University (zhiye daxue)* is not that clear. They may in fact be quite similar. The *Higher Institute (dazhuan)* belongs often to a sector administration at the provincial level, whereas the Vocational College (*zhiye daxue)* comes under the education department of the municipality.

A question for debate: is this TVET or General Education?

Both institutions try to keep a close connexion with the recruiting companies and administrations. This is the main feature, which differentiates them from the universities, who do not care, who have their own programmes in a wide range of disciplines.
Both, *Higher Institute* and *Vocational College*, may offer three-years *specialised programmes (zhuanke* 专科*)* or four-years general programmes (*benke* 本科) leading to the Bachelor degree. The verbal translation from the Chinese term into English is "Specialised course" for the *zhuanke* rogrammes and "Full course" for the *benke* Programmes.
There is a trend that *zhuanke* 专科 Institutions always try to move up to become full *benke* 本科 Institutions, which is beneficial for their staff, as they move up in rank. However, this might be detrimental to their students, as the *benke* 本科 Diploma does not sell better or even sells worse on the employment side.

A question for debate is, if we accept that *dazhuan* 大专 is a part of TVET, what happens with *dazhuan* +1 year, 3 + 1? Is this still TVET, or do the studies now become a part of General Education, as the *benke* graduate can freely continue to enter the Master level. Then, the direct relation with practice and the companies might get lost. But even this is not sure, as "Dual Studies" exist now in several disciplines, and even at the Master's level.
What do the employers think of this one additional year? It was impossible to find an answer to that question during the field visits.

The *Vocational Colleges (zhiye daxue* 职业大学) are the less formalised institutions. Their leaders can opt for designing new programmes with partner companies and institutions. They can be quite creative and tap into new employment opportunities, e.g. in recycling, municipal services, new production lines etc. They may invite professional consultants to help them, in collaboration with the partners from the demand side, in designing the education and training curriculum, combining theory and practice. This includes certainly an organised learning process within the company, linked with the professional profile the company requires.

Some insight from the field study on Vocational Colleges and the potentials for "Dual Studies" (in-college + in-company)

We have been able to collect, in a parallel line of field research, first-hand experience from a group of 5 "Vocational Colleges" in Jiangsu Province (in Nanjing, Wuxi and Nantong) and from 2 companies.

Although this is not the focus of the Apprenticeship Case Study, there is a relation, as the Vocational Colleges are potential partners for "Dual Studies" programmes, in conjunction with companies and sector administrations.

A group of "Vocational College" presidents and Chinese Communist Party Secretaries had visited Germany, the Netherlands, Belgium and Switzerland in December 2012. They were particularly impressed by the "Dual Studies" model, which they visited in depth in Berlin (a "Fachhochschule" having a Dual Studies branch[13]). At an informal meeting in Brussels, the European guide of the group, a Chinese professional having his own small consulting company, and one of the authors discussed with them about the interest of starting a "Dual Studies" initiative in one or several of the Vocational Colleges they represented.

During the visits in Jiangsu Province, this plan did not materialise, but the potential was visible. However, Dual Studies require the same effort of initiative, coordination, good will, funding etc. as "Modern Apprenticeship". However, it could turn out that in China, "Dual Studies" are easier to sell then Apprenticeship. The debate about "Modern Apprenticeship" versus "Dual Studies" will be taken up at a later stage.

4.2 The employment system

The employment system is formally governed by the Ministry of Human Resources and Social Security (renli ziyuan yu shehui baozhang bu 人力资源与社会保障部). The Ministry oversees the implementation of the Labour Code, it oversees safety at work, and it represents China in the International Labour Conference. The ministry is also formally responsible for apprenticeship training, as the apprentices form part of the labour force. The agents of the ministry would have to countersign or give their approval for each apprenticeship contract. This has been the rule in the past, but does not seem to be the case anymore.

Graduates from apprenticeship should find their place on the 5-level qualification scale for workers: the lowest level,

- Level 1, corresponds to workers without training or unskilled and semi-skilled workers (chuji jigong 初级技工).
- Level 2 is the level of skilled workers (zhongji jigong 中级技工).
- Level 3 corresponds to experienced skilled workers (gaoji jigong 高级技工).
- Level 4 corresponds to a technologist or "master" (jishi 技师

[13] Probably the Berlin School of Economics and Law, one of the Universities for applied sciences. The College is part of the "Innovation Club for Dual Studies". www.hwr-berlin.de

- Level 5 to a high level technologist (gaoji jishi 高级技师). It is important to capture, that the highest level is not that of an engineer. Engineers have their place in a different qualification scale, the qualification scale for professionals.

The equivalences between the graduation level of pupils, students and apprentices and the 5-level worker's qualification scale and the sector-specific professional's qualification scale are not clearly established. The closest correspondence existed in the past between the qualification of a graduate from a skilled worker school and the qualification scale for workers. It was supposed that the graduate had achieved the level 2 = the level of a skilled worker.

For decades, graduates from university and from the vocational education and training institutions were "allocated" (literally "distributed" for *fenpei* 分配) to employers (enterprises, administrations) upon their final examination. This system was deemed appropriate in a period with more vacancies than graduates asking for a job. But this relation has changed to the opposite: There are many more graduates than vacancies, except for areas with high need. There is now even a Government level programme, which is intended to fill these gaps. The highest needs exist in the fields of Information and Communication technologies and of highly skilled workers, "masters" and high level technologists.

As graduates have the right to look for employment by themselves and as the use of the Internet is relatively advanced and widespread in China, it has become common for students and graduates to use the Internet for searching employment opportunities. There are even several specialized portals bringing together offer and demand. One of these portals, "Job Offer" (*zhaopin* 招聘) will be mentioned in detail in the following chapter 5.

- Labour contract system instead of life-long employment

The modernisation of China's economy and the transition towards "the global workshop" has technical and financial aspects, but also social ones: The extension of industry and the construction of new factories have led to a complete structure from the simplest to the most complex production processes, from village and backyard workshops to the most sophisticated high-tech factories with a multi-million USD machine park. Technical and Vocational Education and Training is one element, another is the flexibility and response of the labour market and the availability of a workforce, which adapts to the need for rapid change, even if there remain huge gaps at the qualification side.

- "Lay-off" (*xiagang* 下岗) as an accepted means for dismantling state enterprises and cutting cost

The work contract system has been generalised and life-long employment (the "iron rice bowl" *tie fanwan* 铁饭碗) is no more guaranteed. This structural change has made possible to dismantle large and cost-inefficient production units and to create ten thousands of completely new factories across the country. This comes at the price of sending millions of workers and employees to early retirement or temporary unemployment. "Lay-off" (*xiagang* 下岗) of staff

is an accepted means for dismantling state enterprises and cutting cost. In a country, where the trade unions are part of the political and administrative structure (the so-called party state), the transition process can be at least much faster than in any other political set-up.

- Unemployment, the growing social security system with unemployment funds

Unemployment is an accepted feature, but it bears the risk of disrupting social cohesion. Some of the international cooperation projects have been used to put in place trial cases of transition, retraining, public employment services, unemployment compensations and some building blocks of a social security system.

The Chinese labour market is in addition being "stressed" by the yearly arrival of 7 million university graduates, 2/3 of who do not find a job. However, a labour market is not one and the same all over the country. It is differentiated per region, per sector, per level, per vocation. The young workforce has a relatively solid general education, is curious and keen to learn, flexible and mobile, but maybe at the price of solid qualification, precision and reliability.

- Staying home, a new option for youth who do not find jobs

For many young people in the cities, the new phenomenon is to stay at home over months, or even years, before they can take up the first employment.

- Weak or non-existing public employment services

The public employment services exist, but they are not prepared to play the role of a broker: bring together demand and supply and intermediate between employing companies and institutions, and detect the abilities and motivation of job seekers. These processes take years and decades also in other countries.

- Job search via the Internet

The young generation and new technology are dynamic, the search for jobs via the Internet has rapidly developed and it can give solutions, where administrative structures are not used to deliver useful service to the population and not professionally qualified to do so.

- New attractiveness of the party-state as safe employer

In a period, where employment opportunities are getting scarce, the party-state as safe employer has regained some of the lost terrain.

- Is going abroad a valuable option?

An option of easing the pressure on the labour market is to export workers and candidates for employment. Out-migration abroad is a good means for accumulating professional experience, at best for people, who have already a certain basis of knowledge and skills, a solid level of autonomy etc. When they return home, they can become managers and owners of their own enterprise and absorb some of the job seekers in the country.

At the end of this paragraph, the question is raised, whether there is a place for sector and branch organisations, employer organisations and trade unions, chambers of commerce and industry?

5 Apprenticeship and School-Enterprise Cooperation

5.1 Where are the apprentices today?

Existing apprenticeship, as observed during the mission

The field visits in May-June 2013 have given the evidence that apprenticeship exists, and that it may even be "formal" apprenticeship, combining learning at the workplace with a theoretical component given in a vocational school or a training centre. However, the field visits have not allowed getting a quantified picture. Even the qualitative assessment is not representative. And the literature identified dealing with (real) apprenticeship is scarce.

In the example observed during the field mission, apprenticeship was organised, with 9 months of work and training in the barber's shop, and 3 months of theoretical instruction and practical training in a private hairdressing school. The apprentice has to pay the school fees. In the example observed, apprentices do a series of service jobs such as washing clients' hair in the barber's shop, but they are not allowed to cut clients' hair, until they have accumulated sufficient mastery of tools. The branch association of barbers holds the examinations and issues the certificates.

So, in this specific case, the apprenticeship is neither "informal" nor "backward", but just an adapted way of qualifying youth to become autonomous workers, and maybe even the manager or owner of a barbers shop.

The authors did not obtain reliable information on whether apprentices in masonry and carpentry go to a vocational school, to take theoretical courses in technical drawing and applied mathematics, basics, which are essential for becoming an autonomous or independent worker.

Several interlocutors met during the field visits and interviews, suggested that apprentices exist in the construction industry, and some others may be learning and working in electrical appliances repair workshops (repair and maintenance of air conditioners, TV sets, other electrical equipment).

Apprenticeship, as identified on the Internet: The "Zhaopin" Job Offers Website

China and especially Chinese youth have embraced the Internet, for official purposes, for job research, for networking, for the expression of opinions and for social control.

Chen Julan, the author of the doctoral thesis on apprenticeship has undertaken a thorough research of one of the job offer websites, called zhaopin 招聘 = job offers (www.zhaopin.com). She has found out, that there are regularly offers for apprenticeships, alongside with offers for skilled workers and professionals. She has analysed the offers of

1.578 apprenticeship posts, made by 223 companies in 6 cities: Shanghai, Beijing, Guangzhou, Suzhou, Shenyang and Changsha.

She processed the data according to branches, size of company, core competences sought for, groups of vocations etc.

Branches: Out of 11 large branches covering all types of activity, the following four branches offer the highest number of apprenticeship posts: (Table 6-7, 198)

1) Manufacturing and measuring equipment ranked highest with 46 % of requests
2) Consumer goods sales / Commerce / Transport and Logistics ranked second with 35 % of requests
3) Restaurants / Tourism ranked third with 9 % of the requests
4) IT / Internet / Telecommunications / Electronics ranked fourth with 18 % of requests.

Size of company: The research differentiated between three sizes: (Table 6-25, 207)

1) Small enterprises, with less than 100 staff members, representing 47.5 % of the total
2) Middle-size enterprises, having between 100 and 500 staff members, also 47.5 %
3) Large enterprises, with more than 500 staff members, representing the remaining 5 % of the total.

Competences, the companies are looking for: (One respondent may list several items. Table 6.24, 206)

1) "Willing to work hard – diligent" ranked highest with 57.8 %
2) "Willing to learn and to move up" ranked second with 41.3 %
3) "Interested" ranked third with 35.4 %
4) "Team spirit" ranked fourth with 23.3 %
5) "Having experience" ranked fifth with 22.4 %
6) "Stable - punctual, respecting the work hours" ranked sixth with 21.5 %
7) "Disciplined and following orders" ranked seventh with 21.5 %

The lowest-ranked competence was "creativity – innovative spirit" with 0.1 %

Specific jobs, for which the apprentices were sought for: (The total number in the study is 1.578 job offers for apprentices. Table 6-9, p. 199)

1) Repair workers for machinery and equipment (257) ranked highest with 16.3 %
2) Processing workers for machinery production (236) ranked second with 15 %
3) Social services and "living quarter population life services" workers (196) ranked third with 12.4 %
4) Restaurant service workers (191) ranked fourth with 12.1 %.

If one considers the three large categories of workers: specialised and technical staff, workers in commerce and services, workers in manufacturing and repair of production and transport equipment, a clear picture appears:

1) Workers in manufacturing and repair of production and transport equipment rank highest with 53 %

2) Workers in commerce and services rank second with 34 %
3) Not attributable to the three large sectors: 8 %
4) Specialized and technical staff rank fourth and last with 6 %.

From the analysis, one can see that the construction sector does not appear at all. This is probably due to the fact that it recruits mainly migrant workers, who are being recruited by other channels, e.g. by advertising them at the access gates to construction sites.

5.2 "Training for Jobs": The results of a comparative OECD study: Is the Chinese TVET system fit for meeting today's challenges?

The OECD study (Kuczera/ Field 2010), compares the TVET systems of Australia, Austria, Denmark, Finland, France, Hungary, Norway, the Netherlands and Switzerland. It did not include Germany. A specific study on China was added.

The OECD study is of high interest, as it uses the same set of assessment criteria for a number of different countries, and because its focus is on "training for jobs", practical learning and the collaboration of enterprises and entrepreneurs organisations. The China country study has a major shortcoming, as it addresses only Vocational Secondary Schools and their partners, without giving an overview of the whole TVET-employment system. However, it identified sharply some of the key strengths and weaknesses of the whole system.

The study highlights the following strong points and weak points, politely called "challenges" in order not to discourage the partners (pages 15 to 17).

Table 5: Strengths and Weaknesses of Chinese "Training for Jobs"

	Strengths
1	The establishment of nine-year schooling with almost all children in China now completing lower secondary education. (OECD 2010, 15)
2	Around ¾ of the cohort stay on to upper secondary education, and rapidly increasing numbers of young people continue to tertiary education.
3	A strong and simple model for upper secondary vocational education, with a range of specialisations, a good percentage of general academic skills underpinning all programmes, and commitment to workplace training and close relationships with employers. (OECD 201, 15) (*Comment MR: These relationships are not further characterized or scrutinized!)* Each student is required to spend one year on workplace training.
4	Upper secondary education requires fees. But there are two government measures: 1) a national subsidy of CNY 1.500 per year, largely covering school fees 2) From 2009 initiative to make tuition free for Upper secondary vocational school students 3) tax reductions for employers providing workplace training (MoE and State tax administration, 2007) OECD 2010, 19
5	Strong arrangements to ensure that teachers in vocational schools remain abreast of the requirements of modern industry: Obligation that teachers spend two months in industry every two years. (OECD 2010, 15)
6	At the Upper Secondary education level, about half the cohort enter upper secondary vocational schools – with more than 20 million students now in vocational schools. (OECD Study, 5)

	Challenges
1	Quantity: Workplace training is actively encouraged by government policy, which anticipates, that each student should spend one year on workplace training. But cooperation with employers is variable. (OECD 2010, 16) Many schools provide few opportunities for such training. So some school programmes offer an inadequate quantity of workplace training.
2	Sometimes it involves very close relations with a single local employer, with a risk that the skills acquired may not be transferable. (OECD 2010, 18)
3	Quality: There are few quality standards for workplace training. The minimum duration of workplace training is not stipulated. (OECD 2010, 21) Relatively few regulations governing workplace training appear to be routinely enforced. This creates the risk that some workplace training may be of low quality, or focus on too narrow a range of skills. (OECD 2010, 18) Small firms are unlikely to have dedicated training staff. The training offered tends to be unplanned, informal and firm-specific. Firms tend to have a preference for firm and occupation-specific skills, while students also need skills that are transferable to other firms and possibly other occupations. While workplace training needs to yield benefits to employers to encourage them to offer

	sufficient training places, it should not be so firm-specific that it inhibits future professional mobility.
4	Few regional, sectoral and national bodies to engage employers and link them to the TVET system. "In China, the China Enterprise Confederation and China Enterprise Directors Association exists at a sectoral level to represent employers and lists the development of human resources as one of its objectives – but the issue does not appear to play a major role in their work." (OECD 2010, 25)
5	Funding: Financial resources of schools depend on the resources of the province and country / district of which they are part. Given China`s rapid but uneven economic development, concentrated in the coastal provinces and urban areas, the effect is to leave schools in some rural areas and poorer provinces under-resourced. If training is in company related skills, companies should contribute to the costs.
6	Planning to meet labour market needs is insufficient. On the demand side, data on labour market demands are often lacking.
7	Provinces manage some schools directly through the education commission, some through other government bodies such as the agriculture bureau, while many schools are also managed at district and county level. This creates a formidable coordination problem.
8	There are few clear minimum standards for vocational schools in terms of equipment, teachers etc.

5.3 Innovations introduced by the Chinese authorities

Introduction: How to adapt the present TVET system and its components to the needs and demands:

- Needs of employers
- Technological change, up-way to middle-tech and high-tech, from industry = the global workshop to services
- Social demand from youth and parents: the higher the better, but with an increasing risk of unemployment and under-employment
- Change in the profile of the migrant workers

1) **Subsidies for students choosing secondary-level TVET:** From 2009, the policy to make tuition free for upper secondary vocational education. Furthermore, the Government has decided to make available a subsidy of 1.500 Y RMB per year for children from rural areas and poor background, who are willing to embark on the TVET pathway. The subsidy was supposed to cover the school fees. (OECD 2010, 31)

2) **Improving the practical competences of teachers:**
   a) 1 month every year upgrading in companies and training courses, in the regulation 2 months every 2 years
   b) Part-time teachers who simultaneously work in industry (example from Shanghai)

3) **Government investment programme for practice workshops in TVET institutions:** High investment in practice workshops, a lot of equipment, China-made, exhibition space, but not enough space for real practice. In some rare cases, production for clients, under supervision, close to the real-case situation, as observed in Jiangsu (Wuxi and Nanjing)

4) **Tax incentives for companies providing workplace training:** The Ministry of Education and the State tax administration have introduced in 2007 the right of tax reductions for employers providing workplace training. (OEDC 2010 p. 19)

5) **Double certification: school graduation diploma and vocational competence certificate:** Two separate examinations and diploma-certificates: a) a school-based exam and a diploma which documents the school-based competences b) a workshop-based exam with examiners from companies and branches and a certificate, which documents the vocational skills. In some branches, professional examiners are systematically part of the examination committees and the certificates are granted by the branch, and not by a specific company or another employing institution.

6) **One year internship for secondary-level TVET students:** TVET students / trainees in the three types of TVET schools spend their third year, in some cases even a fourth year, as interns in an enterprise. But they have to find the internship place on their own. The Government is considering to set up a fund from which an incentive can be paid to companies if they accept trainees for internships.[14] In fact, Human Resources managers are conditioning the acceptance of interns on payment of compensation. This is exactly the opposite of the apprenticeship model experience in China, in which some international companies pay 9.000 Y RMB per year for each trainee / apprentice, when s/he is at the TVET school. International observers have found, that their level of knowledge was lower than at the end of the second year – which can be explained by the fact, that the internship is not organised and that there is no space for repetition of the subjects acquired during the first two years.

7) **Government funding for training high-level skilled workers and practical technicians:** This includes the "master guides apprentice" scheme, but also the provision

[14] OECD Learning for Job Review China 2010, OECD, Paris 2010, p. 17

that highly skilled “masters” can open a “school” or training centre. (info Zhao Zhiqun) No precise information has been available, whether this is done on a large scale.

8) **The upgrading of Secondary-level TVET institutions to Higher Education institutions:** A large number of former secondary-level TVET institutions have moved up to the higher education level (from zhongzhuan to dazhuan) and some are even continuing, moving from the zhuanke towards a full-scale benke. Even the partner institutions of the German apprenticeship network, built up with the initiative of the German Chamber of Industry and Commerce representation in Shanghai, have chosen this type of institution for their theoretical part and for their organised workshop training part. What is the reaction of the labour market? Now the number of students at the Upper Secondary School level (all three types included, but without apprenticeship) is about the same as that in Higher Education zhuanke institutions.

All this shows, that there is a will – or several wills? We would call this “pieces of a puzzle”: useful, necessary, but not yet sufficient. There must be a general plan, but not yet a law. Otherwise future developments and adaptations get blocked.

6 What are the companies doing to fill the skills gap?

6.1 The Chinese companies, how do they deal with the skills and qualification issue?

A large part of the Chinese companies are state enterprises. Their leaders have a rank in the Communist Party hierarchy, but usually they have also a management competence and some technical competence. Decision making tends to be complex, as the degree of autonomy of the state-owned enterprise management is smaller than for private companies abroad.

With the economic reforms starting in the 1980s, companies have separated those operations directly linked with the purpose of the company, from those being "collaterals", such as education, housing, and other welfare. Investing in the qualification and competences of their staff is rather considered belonging to the unproductive "collaterals", than to the productive core business.

This has changed for some of the growing Chinese information and communication companies. Their leading personnel have understood that investment in research and development and in staff training is crucial for their advancement and their international competitiveness. These companies make also strong efforts to recruit "talented" new staff. They select themselves or charge head hunters and other professional services to help them finding the right staff.

Companies such as Huawei and ZTE have become international players, who set up factories and research centres in Europe and in the United States.[15] They recruit locally, but export the core personnel for management positions. In China, they can rely on a large reservoir of systematically trained engineers. The leaders in this branch are less exposed to the chronic lack of skilled workers, highly skilled workers, "masters" or technologists, than the car manufacturing industry and the machine tool industry.

6.2 How do the foreign invested companies resolve the skills and qualification issue?

At the beginning of the opening-up period, the Chinese partner needed to hold the majority of capital. But today, many of the foreign invested companies are wholly foreign invested companies. Their managers consider the qualification and reliability of their staff as a crucial element for the company's success.

However, for the first as for the second group, the risk of losing personnel, which has been trained at a high cost, discourages the company managers from investing in their staff.

[15] 1) Huawei Technology Ltd.: http://www.huawei.com/en/. Founded by Ren Zhengfei in 1988. Head office in Shenzhen, Guangdong Province, China. 140.000 staff members, turnover 32,4 billion USD and net profit 3 USD in 2011. European head office in Düsseldorf.
2) ZTE ZhongXing Telecommunication Equipment Corporation www.**zte**.com.cn. Founded in 1985. Head office in Shenzhen, Guangdong Province, China. 70.000 staff members end 2012.

The foreign companies work to nearly 100 % with Chinese personnel on the operational level, and they have to rely on the TVET and employment systems which are in place. They can either remain in the mainstream, or create their home-grown solutions. Many of them are probably doing both at the same time.

From the field mission, it became visible that the French, South Korean and Japanese companies use their own in-house training system. They take in:

- Graduates from the secondary education level, from both types of schools, the general secondary schools ("Senior High Schools") and the three types of Technical and Vocational Schools, and
- Graduates from the higher education level, from both, the Universities and the Vocational Colleges

No study was available on the degree of satisfaction of foreign invested companies with the competences and attitude of new recruits.

The results of the Business Confidence Survey of the EU Chamber of Commerce in Shanghai, concerning the human resources[16]

The Chamber was founded in 2000 by 51 member companies. It has now more than 1.700 members in 7 chapters and 10 offices. The organization is recognized by the European Commission and the Chinese authorities as the official voice of European business in China. (45)

The questionnaire of the Business Confidence Survey 2013 has been communicated to 1.403 eligible companies. 526 companies responded (a response rate of 37 %, 23).

36 % of the responding companies employ less than 50 persons, 22 % between 51 and 250, and 11 % more than 5.000.
67 % are Wholly Owned Foreign Entities, 18 % are Foreign Invested Partnership Enterprises and 4 % are Joint Ventures. (23)

Rising labour costs range highest, with 63 %, among the top 10 challenges for future business in China. –The lack of sufficient and qualified talent ranges only 7th among the top 10, with 47 %. (Table 10, 11)

Human Resources management and the ability to attract top talents are seen as one of the key competitive advantages of European companies (62 %, the third highest percentage. The top two items being the variety of products and innovation with 82 %, and brand recognition with 69 %.13).

[16] Business confidence study "European Business in China", European Union Chamber of Commerce in China, Shanghai, in partnership with Roland Berger Strategy Consultants. Shanghai, June 2013

Attracting and retaining top-of-the-class talent (p. 16) is becoming more important: As competition intensifies among local and European firms, greater emphasis is placed on securing the right talent to overcome challenges. While China may boast the largest workforce in the world, finding the right human capital to drive company growth has proven to be a challenge:

- 33 % of respondents view a talent shortage as the primary HR challenge.
- 14 % said that high staff turnover was the third most significant HR issue they currently face.

"While market conditions are changing and competition is increasing, China is still key in European companies' global strategies. This is supported by the fact that 94 per cent of respondents stated that China was either increasingly important in their global strategy or has the same level of importance as it did the previous year. "(26)

The results of the Business Confidence Survey of the German Chamber of Commerce in China, Shanghai 2013 concerning the human resources

More than 2.000 member companies received the questionnaire, and more than 300 responded (return rate: 16.8 %)

37.4 % of the responding companies employ between 11 and 99 persons, 12.6 % between 100 and 199 and 17.9 % between 200 and 499. 11, 6 % employ less than 10 and only 5 % more than 5.000. The medium-sized companies with less than 200 employees constitute with 61.6 % the majority of companies.

More than 2/3 of all respondents are now Wholly Foreign Owned Enterprises (69.1 %). Their proportion has increased by 17.1 % from 2007 to now, and the proportion of Joint Ventures has decreased by 9.8 % over the same period. For the automobile manufacturers and the machine building companies, China is among the three top markets worldwide (67.6 % for the machine building companies and 66.7 % for the automobile manufacturers), for 11 % of all respondents China is the top market. Production sites in the hinterland are considered more attractive than those in the coastal region.

The lack of skilled labour is the absolute key challenge for the responding companies (46.0 % top problem, 37.1 % problem), increasing staff cost (31.2 % top problem, 50.8 % problem) and fluctuation of staff (37.2 % top problem, 37.6 % problem) follow as second and third key challenges.

Observations during the field mission in Jiangsu Province

From the visits in 5 Vocational Colleges and 2 companies in Jiangsu Province, it resulted that some French, South Korean and Japanese companies have established collaborative relations with partner Vocational Colleges, in order to obtain qualified job entrants. They may provide equipment, technical teachers and trainers and additional training material. During the first two years of their studies and training, students go only for a 1-day visit and for short

internships of up to 1 month to the companies, and the company may pay the school fee or another small benefit. The arrangement changes completely with the third year, when the students become full-time interns in the company. However, from the observations it cannot be concluded that this is the practice for all companies in the whole country. It can be expected that there exist many different arrangements.

The shortage of skilled and highly skilled workers is endangering the foreign companies' (multinationals and SME's) production at high quality standards, in a number of mechanics, electronics and computer-controlled production trades, such as: industrial mechanics, industrial electronics, mechatronics, tool making and metal cutting (turning, milling etc.).

With the German companies, two different modes of cooperation have been observed:

One option is that the company sets up its own training department and organises an adapted type of "apprenticeship" or "dual training" on their own.

This is the case for Schaeffler Bearings (trademarks INA, FAG and LuK), a highly specialised foreign owned company, having 6.000 staff members in China and 76.000 around the globe. The company case is detailed in the annex to this report. This company's approach to skills development is innovative, as it goes even to the point of combining Bachelor-level "Dual Studies" (at a Polytechnic and in-company) with the full standard apprenticeship for skilled workers, going for the certificate of a mechatronics technician.

A second option is that the company joins the apprenticeship training network, organised by the German Chamber of Foreign Trade (in fact, its private consultancy arm, the "German Commerce and Industry Ltd.", a private company, owned 100 % by AHK), from its office in Shanghai.

At present, 5 public Training Centres serve as practical training bases. Several hundred companies take part in the scheme. Each company pays 9.000 Y RMB per trainee per year. This amount covers the cost of coordination and quality control, which is in the hands of the professional staff of the Chamber. Since the creation of the network in 2009, around 300 trainees have joined the apprenticeship scheme. The trainees take German Chamber of Commerce and Industry (IHK) exams, one intermediary and one final exam. Several examiners come from Germany to hold the exam. AHK, the German Chamber of Commerce in China issues the vocational certificates, which are recognised by the Chinese authorities.

It can be asked, whether these two options are "apprenticeship" or not.

7 Preliminary answers to the research questions

According to the Terms of Reference, the study on apprenticeship in China was supposed to elucidate the following tentative research questions:

***Question 1*: What is the relevance of apprenticeship for companies, especially SMEs,** *and specifically in the sectors of electronics, textiles and automotive? (=t he core sectors of the SCORE project)*

Answer: The collected information and data are not sufficient to give a reliable answer. The observations during the field mission and the inquiry by the Chinese doctoral student among companies in 6 localities suggest that the interest is high among the companies which are informed about the organisational and financial implications of apprenticeships.

Necessary action: Systematic inquiry with a) the most representative Chinese branch organisations (electronics, telecommunications, logistics, machine building, light industry, wholesale, b) the foreign Chambers of Commerce and other representatives, such as AmCham, EUCCI, CCIFC (Chambre de Commerce et d'Industrie Française en Chine – French Chamber of Commerce and Industry in China), AHK (German Chamber of Commerce in China), similar Japanese and South Korean organisations. However, it will be difficult to motivate these organisations to field an questionnaire-based inquiry with member companies, focussing on SMEs, c) groups of SMEs in localities, where a technical support structure is available, in case of a positive response from companies (no inquiry without a potential for following action).

***Question 2*: Which relevance does apprenticeship have for key stakeholders in the economy:** *Employers' associations, workers representatives in companies and trade unions, and public authorities, foreign partners and investors?*

Answer: No official voice has been heard from employers' associations, workers' representatives in companies and trade unions.

As for the political and administrative authorities, only the Prime Minister and the Ministry of Education have formulated some public statements, which call for closer collaboration between education and training institutions and enterprises. Some public funding is available, it could be used for apprenticeship training, but the information is spread scarcely and there is no technical assistance package available for those willing to embark on apprenticeships. No specific services are offered for (M)SMEs, albeit their potentials.

The foreign Chambers of Commerce and other representations are fully aware of the human resources problematic. The concern for HR ranks high among the challenges, the foreign invested companies are facing. The German Chamber of Commerce has, upon request from active member companies, established an adapted apprenticeship network with training bases in 5 regions.

Necessary action: Same as for Question 1, add interviews with trade unions and workers' representatives in companies, and with public authorities on the national, provincial and municipal level (education, labour, industry)

***Question 3*: Are apprenticeships a valuable way to promote skills development in China?**

Answer: "Yes, but…" Build on the strength of Chinese leaders in establishing viable partnerships, mainly on the local up to the provincial level. But the organisational complexity is a serious constraint (high number of individual companies, varying ownership structures, weak employer organisations, prevailing short-term and monetary orientation, vertically and horizontally differentiated public administration, education and training providers inexperienced with "real" modern apprenticeship, complex regulatory system) Therefore, without a strong advisory and technical support structure which is recognised by the authorities, island solutions may not spread over to establishing apprenticeship as a systemic avenue or career path leading youth from education through training to employment.

Necessary action: Discussion with interested partners, test trials in the second stage of the "Global Product" project, with a focus on information and voluntary action in at least two or three different localities.

***Question 4*: What is the relative importance of apprenticeship, as compared with other branches of the TVET system in China?**

Answer: In quantitative terms, it is still important. However, we haven't found statistical data. For barbers and cooks, and for masons, bricklayers and carpenters in the construction industry it is the training mode, which is appreciated by employers and clients. The request for apprentices on the *zhaopin* website suggests that apprenticeship is more common than officially accepted, leaving it to deeper scrutiny, whether apprentices are only cheap helpers or regular career starters.

Necessary action: Check with construction companies and the construction branch association. Find out, whether practical training is paired with theoretical instruction in a vocational school or training centre. This was the case for apprenticeship in a chain of barber's shops in Shanghai, which was paired with theoretical instruction and some practical training in a private hair stylist school. Check in the Guangzhou area among the companies collaborating with a large Skilled Worker Schools of the provincial labour bureau (a specific case study).

***Question 5*: In which ways are the targeted SME's and key stakeholders involved, or taking the initiative,** in making apprenticeship more relevant and beneficial for SME's? Which types of initiatives and activities do they undertake in this respect?

Answer: No valid answer has been collected for this issue.

Necessary action: Check with clusters of SME's in at least 2 to 3 localities, via a recognised organisation having its roots in the locality. Action can proceed as described in the "necessary action" paragraph under Question 3.

Question 6: ***What are the characteristics of enterprises using apprenticeships:*** Sector, size, level of qualifications needed? Do some sectors use apprenticeships more than others? What about electronics, textiles and the automotive industry (the sectors targeted by the SCORE project)?

Answer: The evidence basis is too limited to give a reliable answer.

Necessary action: Targeted inquiries, using the access points indicated in the other "necessary action" paragraphs.

Question 7: *Is the specific Chinese version of apprenticeship at the post-secondary education level (the so-called* ***"Dual Studies"****, where students-trainees combine study phases at a Vocational College with practical work and training phases in associated companies) a promising avenue? Is it applicable for SMEs in the electronics, textiles and the automotive industry?*

Answer: TVET at the Higher Education level seems to be socially acceptable, as it gives higher prestige to students and parents. Specific examples of "Dual Studies" have not been observed in situ. Students-trainees in "Dual Studies" may have the advantage of being more autonomous than apprentices having graduated from Lower Middle School.

The inconvenient of the Higher Education level is that graduates expect a salary three times higher than that of graduates form Secondary Level education (9.000 Y RMB per month instead of 3.000 Y RMB, as shown in one example in Nanjing). (See the meeting notes of the Schaeffler Company training centre visit in Nanjing) So, many company managers risk being sceptical about the issue.

Necessary action: Keep "Dual Studies" as an option and inquire when meeting with Vocational Colllege and Higher Institute leaders.

Question 8: ***Is the legal and regulatory framework in China conducive for the expansion of apprenticeship?*** *Which adaptations would be needed? How about tax reductions and other types of incentives for SME's engaging in apprenticeships?*

Answer: The government has already launched several investment programmes and incentives for companies. However, these steps seem to be unilateral actions, instead of being negotiated with the partners in the economy: company managers and branch organisations, even if they are weak. Assuming relevant tasks will train the executives and staff of these organisations to become more professional and produce more useful services for companies.

Necessary action: Don't touch the legal and regulatory framework at the beginning. It is better to start action, to win powerful partners, to collect and analyse pilot experiences and then, to adapt the legal and regulatory framework.

Question 9: ***Is there some meaningful experience of international cooperation projects*** *having supported the introduction / strengthening of apprenticeship in Chinese enterprises, with a focus on SMEs? What can be learned from them?*

Answer: Some information may be available, but it is not "ready for use". Countries: Australia?, Germany, Austria, Switzerland (inquire with the SECO representative)

Necessary action: Collect information and analyse the "learned lessons" from the cooperation agencies and key companies, of the following countries: Japan, South Korea, USA, Australia, EU member countries and Switzerland.

Question 10: ***Is the present apprenticeship provision able to adapt to the challenges of a modern economy***, which is gradually upgrading to higher levels of sophistication (higher

value-added in the design, production and marketing process), but also gradually moving from crafts and industry to services

Answer: Yes, if a group of companies per branch takes the initiative, and if a technical agency is available outside. Without this external agency, companies will be overloaded with the organisational work. Even in case of a group of companies, one entity needs to assume organisation and coordination.

Necessary action: Cannot be detailed now, this will result from the further enquiries under the other points.

Question 11: ***What are the lessons, which the "China case" could teach*** *to the international community, and which could become part of a future "ILO apprenticeship modernisation and improvement kit"? Which tools would be key for such a kit?*

Answer: Without strong employer / company involvement and a minimum of organisation, the initiatives will dry out. Funding is not the key issue, but it is necessary for nearly every step.

Necessary action: Nothing on the short run, but systematic observation and collection of practical experience, in order to get a broader basis and learn by transfer between pilot initiatives.

Question 12*:* ***Which are the specific needs of Chinese employers****, a) who are already involved in apprenticeships, b) who are potential candidates for introducing new apprenticeships in their organisations?*

Answer: No valid answer has been collected for this issue. The information collected from international CCIs and trade representatives is not sufficiently specific to support this point.

Necessary action: Direct inquiry with employers

Question 13*:* ***Which complementary measures should be taken, in order to improve the quality of apprentice training?*** *Which are the necessary "****technical assistance" and support services?*** *Which role can the TVET providers outside the companies play in this regard?*

Answer: A technical support package is necessary. The experience of the German Chamber of Commerce in China's apprenticeship training network shows, that improvement is possible. Some of the necessary conditions and measures are:

1) Strong company involvement and commitment, including transparent funding based on a clear unit cost calculation
2) A recognised body assuring certification, with a set of standardised training programmes and purpose-trained teachers-trainers-company mentors
3) Professional support staff overarching the network of local company-training centre alliances. The support staff gives orientation, trouble-shoots and collects lessons for improvement, which it presents regularly to the company managers and involved technical staff.

Necessary action: Identify and strengthen Chinese industrial and services branch organisations, on three levels: National for policy, lesson-learning and regulatory framework, provincial involving the responsible sector authorities, local for establishing the local enterprise-training centre-support entity alliances.

***Question 14**: **Which are the organisations and institutions willing to "advocate" the interests of companies and other employers concerning apprenticeship?** Organisations representing and defending the interests of apprentices, associations or networks of TVET providers involved in the external support part: theoretical and practical training phases, modules and components outside the companies where the apprenticeship takes place. Which are the specific services these organisations can offer within their statutory responsibilities, without generating additional cost?*

Answer: No valid answer has been collected for this issue.

Necessary action: Check with the most advanced Chinese companies, such as Huawei and ZTE, also some leaders in other branches (Lenovo for home computers and laptops, Hai'er and BlueSky for household machinery, Sanyi for building and construction equipment etc.) and propose to their management pilot initiatives.

8 Where to go: the future, an outlook

8.1 What are the constituting components and conditions for "modern" apprenticeship?

Modern apprenticeship is based on the close collaboration between a company, a workshop, an institution, and a "training provider", which can be a technical / vocational Training Centre, a technical / vocational school, and if necessary of a third party, which assumes the role of organising the complex apprenticeship scheme.

Constituting components and conditions are the following:

1) The apprentice needs to have a specific status in the company, which is different from being a mere student on internship, a contract, which defines rights and obligations of the parties involved.
2) The apprentice is entitled to receive an allowance, at least pocket money, a transport allowance and a share of a worker's salary for the period, in which s/he works for the benefit of the company or organisation. The apprenticeship allowance has to be included in the negotiations between employers' and workers' representatives and organisations
3) The apprentice and the apprenticeship must be assured by law.
4) The conditions for safety at work and the respect of youth have to be ensured and controlled.
5) The mode of participation of the involved parties can be multiple and diverse. It hast o be clear, which party has the leading role (the company, the training institution, a third party in charge of organizing and coordinating the apprenticeship (Chamber of Commerce and Industry, a neutral public or private body etc.).
6) The training in the company or organisation has to be systematic, it has to follow an overall plan and clear objectives, and it has to be transparent for all the parties involved.
7) A quality assurance system has to be established, and funded, including the "masters" and "monitors" in the companies and organizations, a legal provision and a supervision of minimal standards for trainers and teachers (example: a decree regulating the requirements for trainers and teachers involved in Apprenticeship)[17]
8) Not all agree with the following conditions, but they form part of the essentials:
   - The company takes the lead.
   - The training takes place at work places.
   - The apprentice is a staff member of the company.

[17] According to Zhao Zhiqun, a Trainer Aptitude Regulation exists, issued by the Ministry of Human Resources and Social Security Protection 人力资源和社会保障部.

The formula of "combine work and study, link school and company (*gongxue jiehe, xiaoqi hezuo* 工学结合，校企合作) cannot serve as a substitute for the full set of these conditions. Cooperative training or cooperative TVET falls short of "modern apprenticeship.

8.2 Where to go: The outlook

One big difference from many other countries with varying economic set-ups is that in China, the economic entities do not have a common ground, where they can formulate and make known their needs and will. There are no Chambers of Commerce and Industry, neither voluntary nor obligatory, no credible entrepreneurs association or federation etc. This may be explained partially by the interests of the Communist Party of China to keep the reign over the economic sector. However, as the interests of the Party, the State and the economic entities cannot be formulated separately, their moving power cannot be tapped sufficiently.

A "Chinese Entrepreneurs Association" exists, but this body does not possess the clout to represent the interests of the major Chinese companies. The companies would rather address the Government and the Communist Party leadership directly than making the detour via this organization, or even the federation for the specific sector (Information and Communication Technologies, Transport, Mining, Heavy Industry etc.).

It seems that the sector organisations for the Electrical and Electronic Industry and for the Construction Industry are having a relative influence.

If anything should change in TVET, this depends clearly on the will and moving power of the 10, 20 or 30 companies of the first range in key sectors. If their leaders decide to implement a thoroughgoing staff qualification policy, TVET may change and become relevant, and apprenticeship may gain the importance it deserves, due to its strong advantages, as compared with the other education and training pathways. No declaration by the government and the Communist Party leadership may be as strong, even if it is accompanied by a dedicated budget.

In 2010, the Government has proclaimed two parallel ten-year strategies, one for education and the other for employment. Both strategies are corroborated through dedicated budget allocations. However, even money cannot replace the political will. If there is a will, the funding may help in implementation.

The Chinese political leaders have understood that China needs to move up in the value chain, from cheap factory labour to medium level sophistication. This is already true for many foreign invested companies. The Chinese political leadership had hoped that the knowhow and dynamism of the foreign partners in the Joint Ventures would spill over to the Chinese leaders and companies. However, this did not happen in many branches, from auto manufacturing to telecommunication, as the technical sophistication goes together with market expertise, design and forecast of future tendencies, and rapid adaptation to changes in the corresponding market segments. In telecommunication, some Chinese companies are

going their own way and they are becoming global players. So they seem to be the appropriate test cases for innovations in TVET, including Apprenticeship and Dual Studies.

Apprenticeship is today in a waiting position. It works, where the demand side (the companies) is sufficiently organised and is ready to pay for the start-up phase. Even if one presents them a calculation that apprenticeship is cheaper than other types of training (e.g. the tool promoted by I:BB Bremen), the fact is that for them it means an additional effort, a lot of organisation etc. This they will only assume, if they are forward looking and if they have thought about how to remedy, if they lose the staff they have trained to their competitors, who do not train their staff, but are ready to pay more.

Why does apprenticeship exist at all, and is not just "informal apprenticeship"? Barber's shops and restaurants depend heavily on the quality of service and production, construction companies need dedicated workers, who may be illiterates or marginally educated, but who are reliable, accept high risk, sub-standard living conditions, long working hours etc. For all these trades, education and training in school does by far not provide the sufficient competences, neither the technical ones nor the personal ones.

But the hope that apprenticeship might "jump over" from these specific trades to become a general feature, is without any ground. Only a sound information and communication campaign, targeting companies sector- and branch-wise, may lead to success. It will have to be matched with a sound technical assistance and support programme, which will certainly not come "free of charge". The companies may be willing to co-finance, but they will hardly do it on their own, except for the "movers" who excel by their will, their decisiveness, their long-term strategy and their financial backing. The challenge is to win the "movers" for a strategy with implementation, which helps their company and which creates a system.

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Annex: Case studies

1) Apprenticeship scheme of the Schaeffler company in China

One option is that the company sets up its own training department and organises an adapted type of "apprenticeship" or "dual training" on their own. This is the case for Schaeffler Bearings, a medium sized foreign owned company. The company case is detailed in the annex to this report. This company's approach to skills development is innovative, as it goes even to the point of combining Bachelor-level "Dual Studies" (at a Polytechnic and in-company) with the full standard apprenticeship for skilled workers, going for the certificate of a Mechatronics technician.

A check on Schaeffler's Website has shed light on the intelligence and creativity of the company's management in terms of training: They offer, apart from the traditional apprenticeship training, taking in youth from Junior Secondary School at the age of 15 or 16, "Dual Studies" at the higher education level. These studies have a duration of 4 ½ years, and the graduates obtain at the same time a Bachelor's degree and the certificate of a skilled worker, e.g. in Mechatronics! So, a hybrid is created, made up by the traditional, modernized apprenticeship and university level studies. This might help in overcoming the social bias against secondary education level training pathways. Could this choice be an example for others? Is it a valuable option for modernising apprenticeship?

The company (trade marks INA, FAG and LuK) is at present the global leader in the production of bearings (balls and rings, rolling bearings, flat bearings and linear systems) for the car and bicycle manufacturing industry and the machine building industry, a high precision product, has established three training centres in China: one in Taicang, the second in Nanjing and the third in Yinchuan, the capital of Ningxia Province in Western China. The company has experienced that it needs its own training centres, even if this comes at high cost.

Their apprenticeship scheme operates in the following way:
They take in Lower Middle School graduates, at the age of 15 – 17 years, for a training period of three years. The Training process is "dual", the apprentices spend around 4 days in the training centre and 1 day in a Vocational School, where they take classes in Politics, Technology and Technical Drawing. In the case of the Nanjing training site, it cooperates with 2 public Vocational Schools. The training vocations are: Turning, Milling, CNC Machining, Hydraulics and Pneumatics, Measuring. Apprentices learn in the training centre by groups of 10 to 12 participants.

The apprentices have to pay the common school fee to the school, but they don't pay for the apprenticeship. During the first two years, they get a free meal at the training centre. In their third year of training, the apprentices will be working in the production departments, but still under supervision. Then, they are paid an apprentice allowance. They will continue spending

some time in the training centre, in order to prepare their final practical exam. The intermediary and the final exam are taken from Germany (German Chamber of Industry and Commerce standard) and the apprentices obtain the certificate for their vocation.

Once the apprenticeship is finished, the trainees acquire the status of skilled mechanics. They have to sign a contract with the obligation that they remain upon graduation for 5 years in the company.

A flashlight on the Company:
Schaeffler employs 76.000 collaborators worldwide, 6.000 of them are working in more than 40 Research and Development centres around the globe. The company boasts an accumulated stock of 14.000 patents, 1.000 new patents are added every year. The annual turnover for 2012 was 11.1 billion Euro. The company is present in more than 50 countries in 180 localities. In China, Schaeffler has 6.000 staff members. The head office is located in Anting (Shanghai) and the production bases are deployed in Taicang, Suzhou, Nanjing (under construction) and Yinchuan (Ningxia Province)

The Schaeffler company's human resources policy is instructive, as it builds on the strengths of apprenticeship, adapting it to new trends and needs:

A check on Schaeffler's Website has shed light on the intelligence and creativity of the company's management in terms of training: They offer, apart from the traditional apprenticeship training, taking in youth from Junior Secondary School at the age of 15 or 16, "Dual Studies" at the higher education level. These studies have a duration of 4 ½ years, and the graduates obtain at the same time a Bachelor's degree and the certificate of a skilled worker, e.g. in Mechatronics! So, a hybrid is created, made up by the traditional, modernized apprenticeship and university level studies. This might help in overcoming the social bias against secondary education level training pathways. Could this choice be an example for others? Is it a valuable option for modernising apprenticeship?

2) Apprenticeship scheme of the German Chamber of Commerce in China

A second option is that the company joins the apprenticeship training network, organised by the German Chamber of Commerce in China (in fact, its consultancy arm, the "German Commerce and Industry Ltd.", a private company, owned 100 % by AHK), from its office in Shanghai.

At present, 5 public Training Centres serve as practical training bases. Several hundred companies take part in the scheme. Each company pays 9,000 Y RMB per trainee per year. This amount covers the cost of coordination and quality control, which is in the hands of the professional staff of the Chamber, but in fact it is the private consultancy arm of the Chamber, which organises the network. Since the creation of the network in 2009, around 1,000 trainees have joined the apprenticeship scheme. They are taking German IHK exams, one intermediary and one final exam. Several examiners come from Germany to hold the exam.

Shortage of skilled and highly skilled workers is endangering the foreign companies' (multinationals and SME's) production at high quality standards, in the following trades: mechanics, electronics technicians, mechatronic technicians, toolmakers and metal cutters.

The 5 sites are: Taicang 太仓, Wuxi 无锡, Zhengzhou 郑州, Jinan 济南 and Shenyang 沈阳

1) Taicang 太仓, Jiangsu Province: Chen Xiong Vocational Training Centre, Taicang. Training period 3 years, 70 mechanics trainees and 30 tool-making trainees per year. Scale of practice and theory 2:1, certificate: skilled worker certified by AHK Shanghai. In July 2012, the first group of 96 trainees graduated through the AHK final exam, all were employed by the company where they were trained.
2) Wuxi 无锡, Jiangsu Province: Wuxi Professional College of Science and Technology. The cooperation started in Summer 2011, the first class of trainees started in September 2011. Training period: 3 years. Specialisations: mechatronics, industrial mechanics and tool-making. Scale of practice and theory 2:1, certificate: skilled worker certified by AHK Shanghai.
3) Zhengzhou 郑州, Henan Province: German-Chinese Training Centre for Mechanical Technicians. The training centre was founded in 2006 by Beijing SWP Intelligent Investment Consulting Ltd. Co. Today, training takes place in only one specialisation: motor vehicle mechatronics. The German-Chinese Training School started at the beginning of 2011. Training period: 3 years. Scale of practice and theory: 2:1, certificate: skilled worker certified by AHK Shanghai. The graduates obtain also a certificate from the Chinese labour office and the Chinese education bureau.
4) Jinan 济南, Shandong Province: Jinan Vocational College. The cooperation started in December 2009, the first class of trainees started in September 2010. Collaborating companies are Festo, Stihl, Hydrometer, ZF and Voss. 50 trainees per year, all in only one specialisation: Industrial mechanics. Training period: 3 years. Scale of practice and theory 2:1, certificate: skilled worker certified by AHK Shanghai.
5) Shenyang 沈阳, Liaoning Province: Shenyang Equipment Manufacturing Engineering School. The cooperation started in 2007, in collaboration with EBG (European Association for Social and Vocational Education). About 200 trainees have achieved a technical certification by AHK and are employed in the partner enterprises. A new cooperation has started in summer 2012 with BMW Brilliance Automotive Ltd. In the two specialisations mechatronics and electrical maintenance. The training course started in October 2012. The training scheme is open for other interested companies.

The management of the network works through a TVET Committee, where the company representatives have the majority. There are not only the Human Resources managers, but also the CEO or deputy CEO, and the production managers. In Jinan, the network consists of some 100 companies around the Technical School or Institute. The companies take the lead. At each training site, there is a Board, in which the company representatives have the majority.

As a rule, the Board meets once every 6 weeks. There is always somebody present from the AHK supervision and monitoring staff. The partners made "mock tests" in the Training Centres and found out 40 deficit points, e.g. in terms of work safety. Once a year, a General Board Meeting of the whole network takes place.

The training scheme includes now only 2 specialisations: in the past, the 2 specialisations were Industrial Mechanics and Mechatronics. Now, upon the request from several member companies, the Industrial Mechanics profile is being replaced by the Tool Maker profile, as it is more dedicated to precision work. There is a request from several companies to introduce a new vocation "environment and water technology", 80 cooperating companies and institutions are active in this area. New needs are also arising in the area of care for the elderly and chemical industry vocations.

The standard training period is 3 years, with 2/3 practice and 1/3 theory. The trainees shift every 4 to 6 weeks from theory to practice and back to theory. In each phase, there is either full-time theory or full-time practice. Each year, trainees have a 2 weeks holiday and they spend 4 weeks on internship in the partner companies.

The system is built on German Chamber of Commerce and Industry (IHK) examinations, with the agreement of the Chinese authorities. AHK trains the examiners. It has obtained all official licences and all training and examination materials from PAL, Christian Verlag (publishing house). The collaboration is formally established, and AHK has the right to change the exams, in order to adapt them to the Chinese conditions.

The reasons for PAL and Christian Verlag giving AHK free space of action, is twofold:

1) AHK is concerned with the quality of training.
2) AHK is able to assure the secrecy of examination items.

The AHK training network has made some adaptations to the German model:

1) The contents on economics and society have been eliminated from the exams.
2) The questions on logistics and the sourcing of materials are being adapted to Chinese practices.
3) AHK makes "mock tests" in the collaborating training centres.

According to Ms. Britta Buschfeld, the Director of the AHK Training Department, the transition rate to work in their system is higher than 90 %. She recalls the history of German support for the Chinese TVET system, which had rather mitigated results. The Apprenticeship Training Network is an answer to the shortcomings of this support. Not only, the interests of companies have been disregarded, but also the Chinese policy makers did not succeed in letting follow facts to the policy declarations.

Her argument is: "If the Chinese cannot do it, we may remain for another 10 or 15 years."

Britta Buschfeld adds:

"One big problem of all companies is maintenance! For this, we need high quality skilled worker training and "master" training. Our mission is to secure qualified and skilled personnel for German companies. And that is what we do. We have participated in TVET-employment dialogue for 20 years, each prime minister has said, yes we do it, but then, nothing changed on the ground. So we say, "we don't engage in politics, "we do, and that's it."

A relatively new feature is that the partner schools – which are all public bodies – become less resilient towards their superior administrations.

The German development cooperation has spent more than 300 million on TVET in China, over a period from 1987 to 2013. In the GIZ portfolio, only one project is now in the implementation phase, in alliance with the 5 car-makers Daimler Benz, Volkswagen, Audi, BMW and Porsche. Volkswagen, Audi and Porsche belong to the same group, but operate in China separately (training area: car mechatronics). The Bavarian Hanns Seidel Foundation is still present, with funding from the same Federal Ministry of Economic Cooperation and Development (BMZ).

The German cooperation has followed a systemic approach, starting from supporting initial and continuing training as a complement for one of the first Joint Ventures in Peking, passing through establishing and running several high-tech Technology and Vocational Training Centres, going to the system level by supporting the establishment of a Research and Development capacity for the whole TVET sector (ZIBB Peking, RIBB Shanghai and Shenyang), and including a technical teacher education component (IBB, Tongji University, Shanghai).

Examples from the field visits of 5 Vocational Colleges (dazhuan 大专) and 2 companies in Jiangsu Province:

1) Nanjing Communications Institute of Technology

This is a Higher Education Institution with 10.000 full-time students, around 5.000 adult and continuing education students, and some 600 full-time staff members.

Since 2004, the institute has a partnership, which links its Automotive Technology School with Toyota (Fengtian), Ford and Peugeot, in the area of training for service technicians, the so-called "4-S Programme". The "4 S" stand for: Sales, Service, Sparepart supply, Survey (information and repair). The students spend 2 years and one 3-months term in the Higher Education Institution and three 3-month terms in the cooperating companies.
Many students have already gone through a three-year secondary education-level specialized middle school in a similar field. So, in the end they will have accomplished 6 years of specialized studies.

The President and Party Secretary of this institution would like to attract further co-operations with new cooperation partners. The institute is already recognised as a training site for the current GIZ automotive project. The leaders would like to establish new cooperative relations with German and other international companies operating in and around Nanjing.

Types of cooperation, the institute would like to enter: 3 years studies in China + 1 year studies and internship in Germany / other European countries, double diploma with these partner institutions, if possible topped by a Bachelor grade.

2) Wuxi Professional College of Science and Technology

This is a Higher Education Institution with around 10.000 full-time students. More than 1.000 companies have settled down in the Industrial Park around the College, many of them are foreign invested companies, from South Korea, Japan, Germany and other countries.

Within this College operates the "Sino-German School", established in 2009. The "school" selects the students first, when they have taken part in the National Higher Education exam. Later, the cooperating companies recruit from this larger group the number they need and they do personal interviews. The apprenticeship or traineeship has a duration of 3 years. A total of 100 trainees are now enrolled in this scheme, out of 2.000 students in the Machine Building Department of the College.

Buildings and equipment have been made available by the Chinese side. The German side supports the cooperation scheme with technical advice, training programmes, examination and certification.

Organisation of the Apprenticeship:

- In the first year, called "basic year": Theory and basic practice with hand work and machine work in the College and one Open Day in the company.
- The second year is called "Rotation Year", because the apprentices go through dedicated phases: 4 weeks theoretical training, are followed by 6 weeks practical training, and so on.
- The third year is called "In-company Year", because the apprentices are introduced to a series of production work places, and they prepare the final German IHK exam in the College work shop and class rooms.

A special focus is laid on teacher training, as the teachers assume a key role for theory and practice. All the practice teachers engaged in the Sino-German School, have taken the German Trainers exam. However, this exam has been designed for a completely different target group: in-company "masters" and highly skilled workers, who are guiding the apprentices. Here the target group is teachers, who have had little experience in doing practical training and guiding the trainees in the College workshop.

The College tries to diversify its internationalisation, attracting other foreign partners. Now, the Machine Building Department cooperates already with Siemens, Murata (Japan), Schneider (France), Rexroth (Germany). The trademarks of these companies are proudly attached to one of the workshop walls.

For those cooperating companies, which are not German and which are not part of the Sino-German School, the training process is organised in a different way, but with some similarities: The students remain in their student status during the first two years, and they shift to a trainee status in the third year, when they join the company, which has recruited them. But already during the first two years, the companies can invite the students for short-term internships.

3) Nanjing Science and Technology Engineering College

This is a Higher Education Institution with around 10.000 full-time students. The College takes in Senior High School graduates through the national Higher Education exam (gaokao 高考).

The mechanical department cooperates with more than 20 companies in the Nanjing area. Close co-operations exist with Siemens, Bosch, Rexroth and Heidenhain, a company specialised in computer control equipment for CNC machines. The workshop produces for external clients, among them a Chinese company, which is producing CNC machines equipped with Heidenhain and Siemens CNC control boards (around 200 machines produced and sold per year).