ISCTE IUL

Instituto Universitário de Lisboa

Construction of High-skilled Talent in Zhongshan City

JIA Dongfeng

Thesis submitted as partial requirement for the conferral of the degree of

Doctor of Management

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December, 2018

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Abstract

The “13th five-year plan” establishes the construction of high skilled talents as an important measure to reinforce China’s comprehensive national strength, and enhance the competitiveness and creativity of enterprises to build an innovative country. This implies a systematic understanding of the concept of high-skilled worker and related theories to consolidate the Party’s class basis by developing the progressive characteristics of worker class under the new historical conditions. This research is intended to offer a contribute by focusing on the case of Zhongshan city.

By means of a mixed method approach, we conducted documental analysis from publicly disclosed information, 11 interviews with four different critical stakeholders, field visits to 22 enterprises in 15 towns and 3 higher technical and vocational colleges, human resources and social security bureaus in two cities, and two large scale surveys (one targeting employees with a sample of 15 375, and another survey targeting enterprises with a sample of 3 075 usable answers). This empirical study is exploratory in nature and looks for insights into current situation about its challenges and problems and develops a model to systematic identify factors to increase high-skilled talent construction in Zhongshan.

The model identified six principles followed by six strategic guidelines for optimal high-skilled talent building. A dynamic model is offered combining ability-motivation-opportunity into a three-cycle process around policies destined to foster, attraction, motivation, and retention of highly skilled workers. Based on the model and the principles, operational recommendations are offered. We contend this model and recommendations offer both practical added value as well as theoretical insight to understand and explain future phenomena of similar nature not only in Zhongshan but also in other urban areas.

Keywords: Zhongshan City; High-skilled Talents; Talent Factors; Economic Growth; Training

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Resumo

O 13 º plano quinquenal elege o reforço dos talentos altamente qualificados como uma medida importante para reforçar globalmente a força nacional da China, melhorar a competitividade e a criatividade empresarial para construir um país inovador. Isto implica uma compreensão sistemática do conceito de trabalhador altamente qualificado, das teorias conexas para consolidar a classe de base do Partido desenvolvendo as características progressistas da classe trabalhadora sob as novas condições históricas. Esta investigação pretende oferecer um contributo focando-se no caso da cidade de Zhongshan.

Através de uma abordagem metodológica mista, conduzimos uma análise documental de informação pública, 11 entrevistas com quatro constituintes críticos, visitas de campo a 22 empresas em 15 cidades e três escolas de ensino técnico-profissional, escritórios de recursos humanos e da segurança social em duas cidades, e dois inquéritos quantitativos de grande dimensão (um visando trabalhadores com um15375 e outro visando empresas com uma amostra útil de 3075). Este estudo empírico é de natureza exploratória e procura identificar pistas na situação atual, os desafios, problemas e desenvolver um modelo para identificar de forma sistemática os fatores que levam ao reforço dos talentos altamente qualificados em Zhongshan.

O modelo identificou seis princípios seguidos de seis orientações estratégicas para promover a atração, motivação e retenção de trabalhadores altamente qualificados. Com base no modelo e nos princípios, são avançadas recomendações operacionais. Defendemos que este modelo oferece quer valor aplicado quer pistas teóricas para compreender e explicar fenómenos futuros de natureza similar não apenas em Zhongshan mas também noutros espaços urbanos.

Palavras-chave: Zhongshan; Talentos; Fatores de talento; Crescimento económico; Formação

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摘要

国家“十三五”规划中，明确表明要把建设高技能人才作为提升国家综合实力，增强国家竞争力和创造力的重要措施。因此，在新的历史阶段，对高技能人才概念及其相关理论的系统理解，有助于培养工人阶级的进步特征，从而巩固党的阶级基础。本研究通过对中山市人才案例的分析提供建设性意见，对国家人才建设作出贡献。

通过对多种理论方法的综合运用，本文分析了公共信息资料、采访了 11 位公司董事，实地考察了 15 个镇区的 22 家企业、3 所高职院校、两个城市的人力资源局，作了两份大规模调查问卷（包括 15375 分员工调查和 3075 份企业调查）。该实证研究的目的在于深入了解目前人才管理的现状、面临的挑战和问题，以便建立起行之有效的人才模型，鉴别出促进中山市人才建设的有益因素。

该人才模型鉴别出六大原则和六大策略方针，以便优化高技能人才建设。该动态模型是由能力、激励和机会三者结合的一个循环模型，在政策方针下顺利运转以便培养、吸引、激励和留住高技能人才。基于该人才模型和提出的六大原则，本文提出具有可操作性的诸多建议。本文认为该人才模型和提出的诸多建议既有理论创建性，也有实践操作价值，不仅可用于理解和解释中山市未来具有类似性质的人才发展现象，而且还可运用于分析其他城市具有类似性质的人才发展现象。

关键词：中山市；高技能人才；人才因素；人才成长规律；培训对策

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Since July 2014, I began to write this thesis to investigate and study the construction of high skilled personnel in Zhongshan. To be honest, it is really a long time for me during the three years from September 2015 when the thesis proposal was formally passed to September 2018 when it finally completed after several times of review and revision.

The writing of the paper has undergone a long complicated process from selecting subjects, collecting data, investigation and study to repeated review and revision and it resulted from the knowledge got during my doctoral study and the experience gained when I worked in the Party and government institutions and universities. It is truly an application of theory into practice by exercises and writing to achieve an unprecedented academic promotion.

For all the achievements I made I would like to extend my deep gratitude to all those people who have offered me practical, cordial and selfless support in writing this thesis.

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Thirdly, a special thanks to Prof. Zhang Cunxin from Zhongshan University of the University of Electronic Science and Technology and Mr. Du Xiong, the English translation of the paper. In the course of the research, I also read the research results of some highly skilled talent work theorists and practitioners. I also express my heartfelt gratitude here!

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本论文 2014 年 7 月 开始对案例中山市高技能人才队伍建设调查研究，2015 年 9 月通过论文开题报告，至 2018 年 2 月完成论文写作和修改任务，历经三年多的时间终于交一个合格的答卷，可谓辛苦多多，收获颇丰。

论文的撰写过程经历了选择课题、搜集资料、调查研究、反复研讨、多易提纲、形成初稿、反复修改、观点提升、论文查重等诸多过程。可谓是运用博士研究生学习期间所学知识的综合、多年来自己党政机关和高校管理实践经历所得的整合、加之博士论文写作格式化要求等多种知识、经验、要求于一体经过三年多的研究形成的最终结果。真正是使自己的知识运用水平、理论与实践结合水平、多种知识理论实践的整合水平、论文写作水平等都有一个前所未有的锻炼与提升。

论文能够得以顺利完成，我们由衷的感谢我的中外导师刘璞和 Nelson Ramalho，他们专业知识渊博、治学态度严谨、写作要求精湛、教学诲人不倦、为人朴实无华，没有其精心选题与无微不至的师恩——提供参考资料、修改写作提纲、多次修改论文提升观点以及给以鼓励完成学业的信心及决心，论文是难以取得事半功倍成效的，亦是很难按时完成的。我由衷的感谢电子科技大学授课老师、同班的博士生同学，没有他们的关心支持，我是很难顺利完成学业的；我由衷的感谢研究过程中走访、座谈等方面涉及到的单位和同志，没有他们的鼎力相助，我的论文是不可能达到如今成效的。特别感谢电子科技大学中山学院的张存俭教授和论文的英文翻译杜雄先生给予的极大支持。本课题在研究过程中，还参阅了一些高技能人才工作理论工作者和实践工作者的研究成果，在此亦一并表示由衷的谢意！

论文的完成，我并没感到有半点的放松，深知论文之中还有一些尚待完善之处，有关子课题还有较大的研究空间。对此，我作为一个研究的新人，将会做出进一步的研究探索，以企为中山高技能人才队伍建设做出新的更大贡献！

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Chapter 1: Introduction

This chapter introduces the topic, its background and the significance of the study.

1.1 Research Background

Zhongshan City, the hometown of Dr. Sun Yat-sen, is a prefecture-level city in the south of the Pearl River Delta in Guangdong province, China, with a permanent resident population of 3,142,300 and more than 800,000 overseas Chinese and patriots from Hong Kong, Macao and Taiwan. Covering an area of 1783.67 square kilometers, Zhongshan City is located along the west side of the mouth of the Pearl River. It lies south of Guangzhou and is not far from Hong Kong and Macao. Economically, Zhongshan has ranked fifth in Guangdong province for many years and is one of the top 20 richest medium and small cities in China. Since reform and opening up, Zhongshan city has created a miracle in the history of economic development. With only 1% of Guangdong's land and 2.7% of the province's population, it contributes 4% of the province's GDP and ranks 5th among the 21 cities in Guangdong province. Its comprehensive competitiveness is among the front-runners nationally. It has been labeled as one of four tigers with Shunde, Nanhai and Dongguan Districts in Guangdong province.

In 2016, its GDP has reached 320.278 billion RMB (43.824 billion Euros). Based on comparable prices, it has increased by 7.8%. Specifically, the added value of the primary sector is 70.12, decreased by 0.4%; while the added values of second and third sectors are 165.739 billion RMB and 145.726 billion RMB respectively, which contributes 43.6% to GDP growth. In modern industry, the value growth for the high-tech industry is 26.528 billion RMB, increased by 14.7% against previous year which takes 19.1 % of the added value of above-scale industries; the value added growth for the advanced manufacturing industry is 56.131 billion RMB, increased by 11.6% which is 40.5 % of the added value of above-scale industries. The added value of equipment manufacturing is 46.271 billion, increased by 12.1%

while private economy added value is 169.373 billion which occupies 52.9% of total GDP. Up to now, there are 20 national industrial bases, 10 provincial technical innovation towns and 483 provincial or above famous brands. So far 24 of the World Top 500 Enterprises have settled in Zhongshan city. Meanwhile 19,000 individual households became enterprises and many other small businesses have become large enterprises.

Being an economically developed migrant city and a pilot city for reform and opening up, as well asa city with an administrative system where the towns and villages are directly governed by the municipality, the government of Zhongshan city has actively seized the opportunities brought by implementing *the Outlines for the Reform and Development Planning of Pearl River Delta Region (2016-2025), the Outlines for the Planning of National Autonomous Innovation Demonstration Zone in the Pearl River Delta (2016-2025) and the 13th Five-Year Plan for Economic and Social Development of Guangdong Province*. The city has lived up to the expectations for the Greater Pearl River Delta economic forecast that placed it amongst the most competitive in the world ten year ago (Enright, Scott, & Chang, 2005). With scientific planning, it actively speeded up readjusting the way of its economic growth. Considering its own advantages, it has made clear its strategic positioning as “one hub, two bases and three pilots”, that is, to become the most important transportation hub for the three economic zones in pearl river delta, to build two bases for the advanced manufacturing industry of the coastal area as well as the important service industry of the west side of the mouth of the Pearl River, to be piloting in balancing urban and rural development, reforming review and approval patterns and upgrading local industrial cluster. At present, economy in Zhongshan City emerged with the following features that the remaining of this chapter will explain: the new normal, the new challenges, the new tasks, and the new model.

1.1.1 The New Normal

In the last 40 years since the reform and opening-up, Zhongshan city has created a miracle in the history of economic development. Its comprehensive competitiveness is among the front-runners in China. Today, the economy of Zhongshan city is heading for a

development stage of more advanced form, more complex division and more rational structure. The economic growth has shown a new normal. Especially after the financial crisis of 2008, the fast growth is gradually shifting to intermediate growth.

The massive, inefficient, unsustainable fast growth model is being replaced by high quality, efficient intensive growth. The once bring-in focused economic strategies has been transformed to the combination of "bring in" and "go global" together. Introduction of foreign funds and technology shifted to introducing talents, brands, funds, and technology. To earn foreign exchange through export in both quality and quantity rather than mainly in quantity. Trade of commodities has been transformed to funds, technology, energy, management and commodities. Labor intensive products, processing trade exports have been changed into product with accessional value and self-owned brands.

In the large Zhongshan model (Chen & Dickson, 2018) economic openness is shifting from local areas to areas home and abroad. The outlook is to combine openness in economic field with openness in other fields of multi-domain, high-level economy. Additionally, state-owned enterprises are going outside private enterprises and social organizations are also developing globally. The traditional cooperation between Hong Kong, Macao and Taiwan will be replaced by cooperation between some new areas alongside one belt and one road areas, Europe and America. The opening-up has shifted from Pearl River Delta region to new modes of combining wild goose mode and multi-level.

Industrial structure changed into low and middle and higher level. Economic structure is optimizing and upgrading gradually by destocking, deleveraging, reducing excess capacity and costs. Reform on supply side is deepening continuously. The service industry has become the mainstay of consumer demand and the gap between urban and rural areas is narrowing down. The market acts decisively rather than fundamentally in the disposition of resources. The market allocation of resources proves to be the most effective way both theoretically and practically because supply and demand determine the allocation of resources as the essence of free markets.

The economic well-being transformed from the unbalanced to inclusive mode. Migrant worker co-construction and sharing of well-being of urban cities is put into agenda (e.g. Dang,

2015; Lin et al., 2016).

Economic growth has transferred from the stage pushed by natural resources and investment into the new stage driven by human resources development and innovation. Both preferential policy and system and mechanism innovation are adopted to attract external resources. Opening to overseas investors and retaining domestic investors are equally stressed. Economic development has developed to progress by scientific advancement and improvement of labor's the quality since science and technology are the foundation of national prosperity, and innovation is the soul of national progress. Therefore, strengthening the construction of high-skilled talents is necessary for all enterprises to adapt to the new normal and improve their qualities.

1.1.2 The New Challenges

At present, the aging population, tight labor market and the trend of high quality requirement for personnel and high salary demand and other factors lead to serious problems regarding the scale, structure and quality of high-skilled talent teams. The diminishing of demographic surplus has become an obvious bottleneck for the industrial upgrading and economic growth of Zhongshan City.

Compared with developed countries, high-skilled talents in Zhongshan City, Guangdong province are still insufficient and the distribution between townships, enterprises and occupations are unbalanced. Technicians and senior technicians still account for a relatively low proportion of the skilled workers. Investment in R&D in high-tech industry is still low compared with developed countries and influential platforms supporting technological transformation are insufficient for the increasing demand of hi-techs.

Zhongshan city has once attracted large amounts of foreign investment to develop processing trade by central policy, foreign capital, national labor, comparable low costs and accumulated its primitive capital to establish its industrial system to promote labor employment. The time when the foreign-funded exports to develop economies and people's livelihood has gone since a report has been made in Dec. 12th, 2016 in 14th Party Congress held in Zhongshan City which declared that in the ensuing five years the traditional

development modes (which focus on special towns, land expansion and townships) will be unsustainable due to less competitiveness, low efficiency, and unattractive high-end elements respectively. Meanwhile urban spatial distribution is unsuitable for building livable city because of irrational use of land resources, especially the upgrading industrial structure, unbalanced district economy development and poor business environment. These are all challenges to policy makers.

Past-experience on industrial structure upgrading showed that the internal cause of industrial upgrading is the structure and quality of human resources. The key to the success of industrial transformation and upgrading and the development of economy and overcoming the bottleneck regarding the scale, structure and existing quality in high-skilled talent teams lies in whether there are many workers training themselves to become technicians or high-skilled talents, whether the construction pace of high-skilled talents teams is accelerated. This is the answer to realize the progress of "cultivating new giant businesses, building new platforms, attracting new talents".

1.1.3 The New Challenges

In order to meet the new challenges, adapt to the new normal, a proposal was made by Xi Jinping in April, 2017 stating that Guangdong is essentially important for national supply-side reform, innovation-driven development and open economy establishment. It should be front-runner in building up all round social well-being and modernization drive.

Other meetings and congresses also give great hints on the supply-side reform, innovation-driven development and open economy establishment since it can speed up Guangdong – and even China's – international competitiveness and coordinate development between regions and cities such as the declarations make in 12th Guangdong Party Congress. Some detailed implementation plans, outlines and programs issued by central and local governments have arranged specific tasks to complete for future goals to attain. Up to now eight high and new tech development zones including Guangzhou, Zhuhai, Foshan, Zhongkai in Huizhou, Songshanhu in Dongguan, Huju in Zhongshan, Jiangmen and Zhaoqing have been established as National Independent Innovative Demonstration Zones in Pearl River

Delta. Zhongshan, located in the center of Guangdong-Hong Kong-Macao Greater Bay Area, will meet new chances for development. The greater bay area covers an area of 56,000 square kilometers with a total population of 6.6 million. Its economy reached 1400 billion US dollars in 2016 with trade value of 2000 billion US dollars. Hongkong, Macao, Guangzhou, Shenzhen, Zhuhai, Zhongshan cities benefit a lot from the greater bay area. Just like Tokyo, New York, Los Angeles and San Francisco Bay Areas the Guangdong-Hong Kong-Macao Greater Bay Area will be a global city cluster and place for competition area.

Meanwhile, the New Silk Road and Maritime Silk Road proposed by Xi Jinping in September and October in 2014 also give Zhongshan a great historical developing opportunity. For this proposal, China has been put into the international community and the relevant countries are called out to create a win-win "community of interests" and "community of destiny of mankind" for future prosperity together. China's inland and coastal areas need to promote the trade flow, accelerate infrastructure unicom, implement the policy of communication, the circulation of funds and the people's communication which are called the five establishments. "One Belt One Road" is intended to promote peace, prosperity, openness, innovation and civilization among different countries alongside it.

It is necessary for China to adapt to the new normal and push forward the supply side reform for its new normal of economic growth and also strategic policy for macroeconomic management. Attention should be paid to production to reduce overcapacity, promote industrial optimization and reorganization and cut costs. Besides, development of strategic new industry and modern service and increasing public products and service supplies will also be important for the goal.

A series of strategic outlines and plans issued by Organization Department of the CPC Central Committee and the Ministry of Human Resources and Social Security can be refer to in order for Zhongshan city become ready to raise its standards to cooperate with European countries and emerging new economies and to reach its due goals such as actively participating in the construction of the greater bay, deepening the cooperation between the Greater Pearl River Delta and other areas, pushing forward economic transformation, and upgrading the structure through readjustments. In this way it is expected that quality and

benefits are promoted for the establishment of a new open economy. The key point of all these documents is whether there are sufficient workers training themselves to become technicians or high-skilled talents, i.e. whether the construction pace of high-skilled talents teams is accelerated.

1.1.4 The New Model

To better understand the overall context of Zhongshan challenge regarding highly skilled work needs one must know the new concepts, new ideas and new strategies for national governance that were designed to promote coordinated development of the five establishments in one overall layout.

The “new concepts” refer to the five concepts of innovation, coordination, environment friendliness, openness to outside, and common interests. These new concepts are not only fundamental policies for the new normal of economy but also guides for solving outstanding problems and challenges. It is so formed based on experience gained domestically and abroad as well as from the analysis of global complex economic situation.

The “new ideas” concern the focus on a special socialist construction and overall layout of the five establishments united in one comprehending: economy, politics, society, ecology, and civilization. It is a mainstay for China to continue to carry out special socialism and preserve it as the soul of governance. A series of new policies and ideas put forward by Xi Jinping since the 18th CPC National Congress can be summarized up under the topic of China’s Special socialism. These ideas cover all walks of life in China. For example, subjectively adapting to and taking a lead in the development of the new normal and promote sustainable and healthy economic growth; democratic policy with socialist features; giving full play to the advantages of socialist political system; the utilization of the core values of Chinese socialism to consolidate people’s unity; improving people’s livelihood and innovating society governance to make people have a happy life; the construction of ecological civilization for green mountains and clean water are invaluable wealth.

The “new strategies” concern the strategic goal of rejuvenation of China’s civilization and layout of the four-all-round way. The “four” are important for China’s sustainable

development and its realization of China's dream of rejuvenation. They are as follows: first, construction of a well-off society in an all-round way which is our striving goal to attain by the end of the year of 2020; second, deepening the reform; third, managing state affairs according to law in an all-round way; fourth, running the party strictly in an all-round way. All these all-rounds are integral parts for final goal.

The international competition today even in the future is after all the competition for talents and advanced theories. The one who has more and better qualified personnel and theories for high-skilled talents management will be able to integrate human resources, gain the initiative in the competition and win the future. Priority for talent development and the integration of talents are the driving force of many nations' rapid economic growth as well as the reason behind the constant leading roles of developed nations in economic and technological fields (Cerna, 2016). In the context of globalization, only when having adequate talents, especially a team of high-skilled workers and advanced guiding theories, can China occupy a strategic position in fierce international competition and realize the shift from "made in China" to "created in China". It is not only of great theoretical and practical significance but also an important job for local governments to investigate the theories which can guide governments to promote and direct the construction of high-skilled talent teams macroscopically. The new normal, new challenges, new tasks and new theories force us to strengthen the construction of high-skilled talent teams, to enhance the quality of human resources.

Faced with the grim situation, all the politicians, brokers, economists, and investors should recognize the new normal, adapt to the new normal and play leading roles in the new normal. It is particularly important to realize that the high-skilled talents are an important force in production and play a vital role in the survival and development of enterprises. High-skilled personnel are an important force to promote technological innovation and facilitate the industrial application of hi-tech research findings. They play a vital role in creating new advantages in economic development of enterprises. The rapid and healthy development of high-skilled talent teams is critical to the comprehensive, coordinated and sustainable local economic and social development. The study on the construction of

high-skilled talent teams is also of great significance to establish the theories on high-skilled talents with special China's features.

According to Cooke, Saini, and Wang (2014) talent management has been accused of being a fashion in HRM (basically stating in a novel way what has always been stated ever since HRM established itself as a field of research: that everyone has skills that organizations should use to its best based on effective HR practices). It was also accused of oversimplifying the issue by emphasizing succession planning. However, it is also true that talent management has been approached from the "managing talented people" (focusing on high-potential / high-performing workers) and from a focus on positions instead of people (i.e. that talents are not people but instead strategic positions in organizations, which can also extend to societies at large, focusing on strategic positions at the macro level). The present study adopts the third and fourth lenses as it takes a macro level analysis of a territorial talent management situation (i.e. Zhongshan).

Against this background, this thesis attempts to comply with the new requirements, find out the current situation of enterprises' construction of high-skilled talent teams, analyze the causes of existing problems and come up with the countermeasures. This is intended to provide a decision-making reference for the medium and small cities as well as Zhongshan government.

1.2 Significance of the Study

This topic is both relevant from the practical and theoretical standpoints. As regards practical value, highly skilled talents are outstanding representatives of all walks of life and are the core backbone of skilled workers. They play an irreplaceable role in speeding up industrial upgrading, enhancing competitiveness, promoting technological innovation and transformation of scientific and technological achievements. Therefore, it is of great practical significance to do research on the construction of high skilled personnel. As regards theoretic value, workforce shortage with a focus on highly skilled workers is a novel issue within a unique context such as the one provided by the Greater Pearl River Delta region, of which

Zhongshan is a core case. The Guangdong model in a novel way of putting together a system where challenges, amongst which workforce qualification management, is a case from which all future developed economies can learn.

1.2.1 A Major Strategic Decision to Build an Innovation-oriented Country

The international competition today and even in the future is for the talents. If a country has more and better talents, it can enhance its comprehensive national strength, enhance its competitiveness and then gain the initiative to win the future. High-skilled personnel are not only an important force in the production in companies, but it also plays a vital role in their survival and development. At the end of 2003, in the talent work conference held in China it was pointed out that the modernization drive required a large number of leaders good at governance of the party, the state and the military and high-level professionals, entrepreneurs familiar with domestic and international markets, the entrepreneurs with modern management knowledge and ability, highly-skilled talents who master advanced technology and skills. To speed up the independent innovation we should know that the main body is the enterprise while the key is the talents. The high-skilled personnel in China is an indispensable force to promote technological innovation and realize the transformation of science and technology. To improve the core competitiveness of enterprises, one needs not only scientific research personnel who master the core technology, but also many highly skilled personnel to master the modern manufacture technology-. It is also very difficult to translate technology and equipment into practical productive forces if one has no such talents, not to mention the first-class products and first-class brands and occupy a space in the fierce competition in the international market. Strengthening the creation of highly skilled talents has become an urgent need for improving local comprehensive competitiveness in the new situation. It is also a necessary means to enhance the core competitiveness of enterprises, and it is also an inevitable requirement for the realization of struggling goals in next two centuries.

1.2.2 To Promote the Coordinated Training of Different Talents

To build a well-off society and China’s dream, all kinds of talents at different levels are needed. That means not only entrepreneurs with pioneering spirit and senior experts standing

in the forefront of science and technology in the world, but also high skilled talents and all kinds of practical personnel with superb skills are necessary. To establish and implement the scientific concept of talent and strengthen the creation of high skilled talents, it is advantageous to promote the in-depth development of human resources, improve the quality of workers, and create a social atmosphere that is beneficial for all kinds of talents. Therefore, it has great and far-reaching significance to promote all-round development of people.

1.2.3 To Create New Development Advantages

In April 2006, the CPC Central Committee and the General Office of the State Council issued *the Opinions on Further Strengthening the Work of High-skilled Talents* which clearly pointed out: "high skill talents plays an irreplaceable role in accelerating industrial upgrading, improve the competitiveness of enterprises, promoting technological innovation and transformation of scientific and technological achievements." （The General Office of the CPC Central Committee [GOCPC] & the General Office of the State Council [GOSC], 2007：61）At talent work conference held in May 2010 Hu Jintao, the then general secretary of the CPC Central Committee, pointed out: "we need to develop and utilize two kinds of domestic and international talent resources, focusing on high-level talents and highly skilled talents, and promote the construction of all kinds of teams." General secretary Hu Jintao also attaches great importance to the construction of high skill talents, when he visited the Guangdong Zhuhai Senior Technical School he said: "Without first class technicians there would be no top products" also pointed out that "talents play an irreplaceable role in promoting independent innovation".

1.2.4 An Inevitable Requirement to Establish a Strong Middle Class in China

Since high skilled talents are the outstanding representatives and the core backbone of work-class in China, the continuous improvement of the quality, quantity and the role of the working class will surely enhance its overall quality so that the Communist Party's class foundation will be consolidated. Therefore, only by speeding up the training of a group of high-skilled personnel and high-quality workforce with superb skills and ability will it be possible to strive for new advantages in the fierce international competition. Then it is

possible to realize the shift from "China imitation" to "Chinese manufacturing" and then to "China creation", then it can develop the advancement of work-class, consolidate its status in the process of economic development and national strength growth.

1.2.5 To Achieve the Great Rejuvenation of Chinese Nation

The problem of the shortage of highly skilled personnel is a practical problem faced by all the countries in the world. The training and cultivation of high-skilled personnel has also been paid more and more attention from all walks of life, especially in the academic circles. Therefore, when the training of high-skilled talents becomes critical issue and attracts attention home and abroad, a case study on the creation of human resources in Zhongshan city and careful analysis of the situation and tasks of training of high-skilled talents will be very useful. This thesis probes into the basic concept, essence and characteristics of the contemporary high-skill talents, in order to reveal the internal rules and factors and try to find effective ways and methods of cultivating high skill talents. It can also help to provide theoretical and practical guidance for China to improve training program and rule out relevant policies for the cultivation of high skilled talents. Therefore, exploring the law of the construction of highly skilled talents is of theoretical and practical significance for implementing the strategy of "talent and powerful nation" proposed by China. It can also be an example for other countries to answer their challenges in dealing with similar problems.

Having this in mind this research is structured to depict and analyze Zhongshan city case on dealing with skilled labor shortage and building capacity to cope with the future challenges. To achieve this, we will conduct a literature review on published research conducted both in China and internationally with a focus on high skilled talents. The purpose is to find out an explanative model. The case study is conducted according to guidance for state governance: first we do case analysis from Zhongshan’s current situation and past experiences, and then find out related problems and analyze the underlying reasons for these problems. After that, practices, policies and theories home and abroad are to be discussed for further exploration of the goals, principles, processes, structure, responsibilities, and environments of the construction of high skilled talents. The structure is as depicted in Figure 1-1.

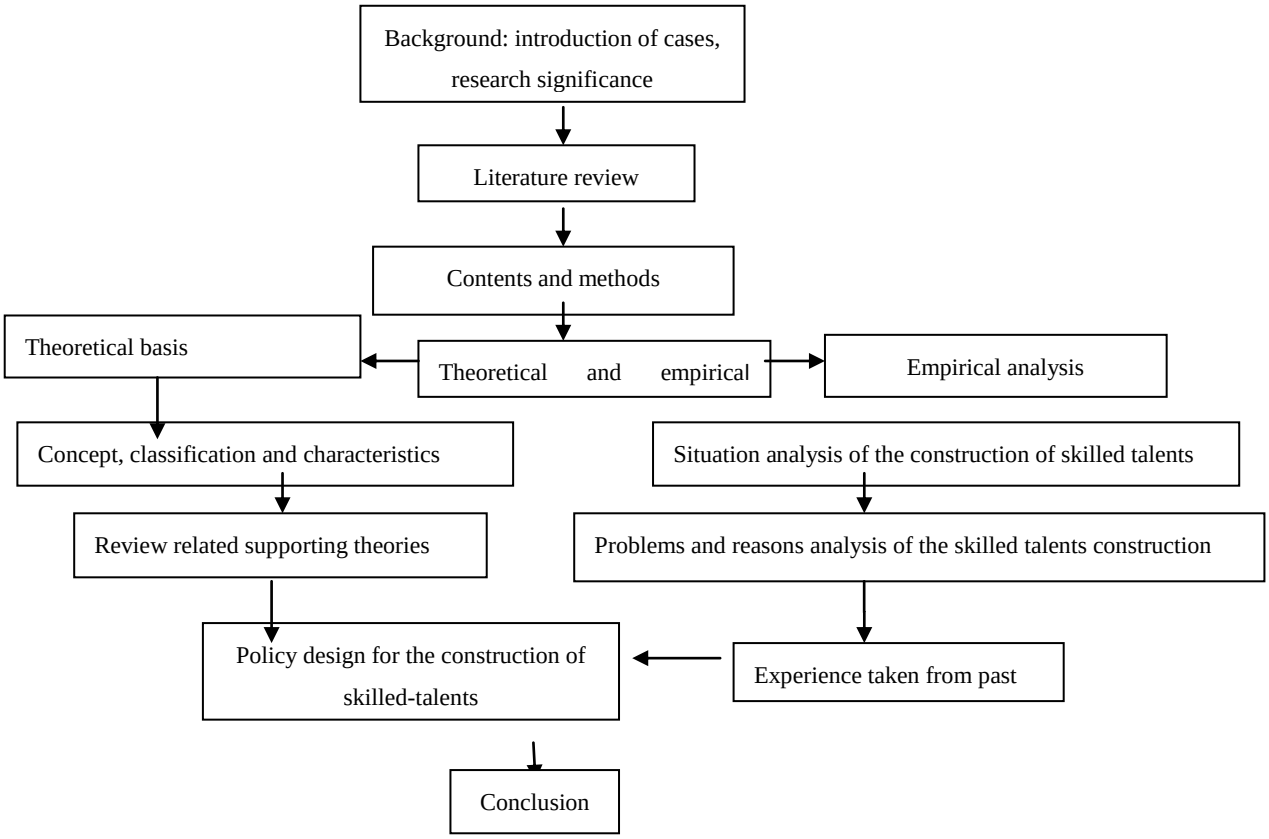


Figure 1-1 Research road map

Chapter 2: Literature Review

This chapter sorts out and defines the concept, structure, main features and status of high skilled talents. It mainly classifies different concepts at different levels, especially the definitions of ability, structure, and element of high skilled talents. It points out the four features of high-skilled talents, namely operating ability, creativity, adaptability and self-reliance and it clearly states their active role in production, technology, innovation, communication, and management. The purpose is to recognize the concept, meaning and characteristics of modern highly-skilled talents, so that we can do less work and the result will be better if regular rules are discovered in production, accumulation of skills, and cultivation of first-rate talents and motivation of high-skilled talents.

After this we collected and integrated from several sources, a system level characterization of the Chinese as well as international cases, successful in high skill development countries, to gain a systemic view of how policies and practices are integrated into functional structures.

The literature review ends with a set of propositions destined to seed a model that is used to analyze and understand the Zhongshan talent management situation.

2.1 The Concept of High-skilled Talents

2.1.1 The Concept of High-skilled Talents

The concept and characteristics of highly skilled talents are the basis for studying all the problems of highly skilled talents. As a starting point of thinking and basic element for judging and inferring, concepts needs to be clarified because it is the basic requirement of correct thinking. It is also a general rule that as the fact is recognized from a thing first, then the concept of it will be observed, ultimately the thing will be further developed if the fact and the concept of the thing are deeply studied. As a matter of fact, the concept of high-skilled talents has not been proposed until recently though it was conceptualized long time ago. It

was at the Meeting on State Talent Management Work in 2003 that the concept of high skilled talents was put forward as an overall rule of the strategy of enriching the State by talents. So, to have a deep understanding of the concept of high skilled talents we describe the concepts of talents, skills, technician, skilled talents and high skilled talents as follows.

2.1.1.1 Definition of Talents

Generally speaking, a person of talent means an outstanding person. The research on talent was developed in the late 1970s producing since then different definitions from different angles. At present, they are defined from five aspects, namely the excellence, the particularity, the professionalism, the creativity and contribution, and the ability of the talents. In short, people with ability, dedication and creativity are talents.

In September 22, 1986 a paper published in People's Daily (China’s important newspaper for publicity) defined it as "Any people who are outstanding and have made great contribution to society can be defined as talents and they are different with their different abilities. Many people who have no college education but have a rich practical experience and high levels of management are talents and even technical workers are talents if they are excellent." So the concept of talents has been broadened to a large extent. Concordantly, we define talents as: in addition to persons with secondary school education or professional qualifications for technical posts, the personnel who have no academic qualifications and professional titles but with a considerable level of professional skills or anyone work at managerial posts are all talents if they are excellent.

2.1.1.2 Skills

From the perspective of the emergence and development of skills, skills have always been accompanied by the survival and development of human beings. However, so far few experts and scholars at China and abroad have researched "skills" for special analysis and with an in-depth research (Bi, 2006). Research mainly focuses on four theoretical perspectives of philosophy of technology, psychology, vocational education and behavioral research.

Usually, technology philosophers define skills from the relationship between skills and technology and thus five kinds of representative views have been formed. First, skill is

technology. Ancient Greek philosopher Aristotle said, "technology is the skill of human activities (Skill)". French technology philosopher Jacques Ellul defines technology as rational effective activity (Ellul, 1964). Taking skill as an essential attribute of technology is a major feature of ancient technology view (Chen & Zhang, 2002). Murata Fujiro in Japan believes that skills are the special abilities only trained people obtained and directly or indirectly utilized in production (Fujiro, 1981). Especially important, for skills, people can use their own knowledge, ability and judgement. That is to say, skills are the thing only human beings have, since they are the main body of transformation of natural activities (Yuan & Chen, 1985). Second, skill is the basic element of technology. The German philosopher of technology Friedrich Rapp defined technology as skill, engineering science, production process and means (Mitcham, 1994). In his many volume book called “History of Technology” Charles Singer, the British historian of science, defined technology as the sum of skills, abilities, means and knowledge that human beings can apply into the usage of the large amounts of raw materials and energy stored in nature according to their own wishes. (Singer, Holmyard & Hall, 1954). Experience, skills, tools, machines, knowledge which are the basic components in any production, profession and majors are the basic elements of technology, (Chen & Zhang, 2002). Third, skill is equal to the technical operation. Carl Mitcham, the American philosopher of technology, believes that "technical operations are human activities to attain some kind of structure by their own means. The term skill is coined to emphasize the connection between technical operations and manufacturing processes." In ancient times, "technology refers to the skills of laborers, which represent the ability of workers to process and produce objects through their own hands." (Lin, 2004). To equate technology to skill as a human ability adopted the original meaning of the word "technology". It refers to experience, skills and arts acquired through proficiency. Lenin said, "the transition from handicraft shops to factories marks a fundamental change in technology, which has overturned the traditional skills of craftsmen which accumulated after hundreds of years (Lenin, 1972)." Therefore, as machines and industrial applications dominate, skills gradually become the process of making and using machines (Chen & Zhang, 2002). Fourth, the skill is conceptual technology. Tosaka Jun who pioneered technology theory in Japan believes that technology is a combination of subjective existence of the conceptual technology including skill, intelligence and objective

existence of material technology including tools and machines (Kawashima, Schefer & Stolz, 2013). Fifth, skill is a special type of knowledge, which is equal to experiential knowledge which are the main activity in people's production. Ralph Sanders, a technology philosopher, calls it as, "Know-how". Miqiemuze further argues that the ancient knowledge learned from experience is descriptive skills and criteria. He equates skill to knowledge learned from experience, and thinks skill is a practical knowledge and should be perceived from the perspective of psychology. In the study of the connotation and characteristics of "skill", Professor Peng Danling believes that "skill refers to the action and action system that people get through practice. It is a kind of individual experience which is mainly expressed as action execution." "Skills have the characteristics of stability and flexibility. Proficient skills are skills that are compatible with all kinds of changing situations. When situations change, skilled people can flexibly use their skills and actions, so that the development of skills is not restricted by certain fixed action modes and flexibility the results from long term learning and practice, (Peng, 2001) From the perspective of vocational education Bi Jieli, the Secretary General of Staff Education and Vocational Training Association in China, said, "skill refers to a certain form of action or intellectual activities or techniques, formed by training with their own knowledge and experience." He pointed out that "the basic feature of skill is the strong internal connection for skill’s promotion since the formation of skills depends on the degree of practice and use; the development of skills is closely related to technical development and application as the former restricts the latter; the standard of skill is associated with the job task, and has the characteristics of the development of the times. Skills can be divided into motor skills and intelligence skills, namely cognitive skills. Motor skills refer to movement skills and operation skills. Intelligence skills means to perform mental activities in the brain by language information (Bi, 2006). Then from the perspective of behavioral studies, professor Zhou Yangping said: "skill refers to a way of action or intellectual activity gained through practices which can successfully complete certain tasks." "Skill learning is different from knowledge learning: the essence of knowledge learning is the study of" meaning "for the purpose of understanding and application, while the essence of skill learning is the study of' rule ' in order to master the way and method. "Knowledge learning mode can’t be applied into skills learning. The formation of skills is a process of continuous practice and gradual

development which generally consists of three stages, namely, decomposition and imitation, overall mastery and coordinated proficiency (Zhou, 2006).” However, as a concept connotation of "skill" is not unchanged. As professor Sun Zhengyu pointed out, "the connotation of concept has a historical and cultural content. No concept is fixed since all definitions are a historical progress of development, (Sun, 2004). The above interpretation of skills has certain rationality and it is justified to have different understanding of the concept of skill based on different perspectives, which shows that the essential features of the skills are extensive. It needs to be clearly pointed out that the concept of "skill" studied in this article is "narrow". It refers to the skills of "natural technology" in manufacturing, processing, production and service while "social skills" are not included. At the same time, based on the understanding and recognition of the concept of "skill", we should also consider the characteristics and cultural background of high skilled talents of this time when we study the mechanism of high skill acquisition and the law of high skilled talents development. Only in this way can we bring up standard training mode for the high skilled talents in accordance with the requirements of the times.

Another issue pertains the characteristics of skill. From the application and technical practice of skills there are five basic characteristics of skills namely, individual dependence, relatively ineffableness, time historicity, emotionality, and level hierarchy.

(1) Individual dependence is the most obvious characteristic of skill because skills must be performed by individuals in some place. For example, in ancient times the empirical skills usually accumulated by craftsmen from teachers and fathers. (2) Relatively ineffableness is another feature because skills can be passed on by words and language while some others’ can only be sensed since they require professional jargon. Therefore, it becomes difficult for some people to get useful information from the already known knowledge because it is the accumulation of experience and imitation in a long term in daily work. (3) Time historicity means that skill is acquired by long experience accumulation and historical inheritance in the process of technology practice. Experience accumulates from using skills to produce. Without experience, there would be no such skills. (4) Emotionality concerns the inference that direct emotional interest will have a positive impact on the formation of skills. In an effort to

understand the mysteries of know-how and skills, one can become expert through long-term accumulation. Lastly, (5) level hierarchy comes as a requirement to the formation and development of the subject's skill because it is a process from the low level to the high level.

So, skills are inherently individual, often ineffable, developed across time through experience, subjected to emotional motivation, and varying in degree of proficiency.

2.1.1.3 Technical Talents

Technical talents refer to the talents that can transform the engineering design into production, that means they can make the design, planning and decision-making of engineering talents become the final product or the concrete flow of the social operation. They play a direct role in specific production or social activities such as factory technicians, process engineers, agronomist and so on. Technical talents and skilled talents are two easily confused concepts. Technical talents and skilled talents are classified according to the purpose of production or work activities. With the development of science and technology, the working process is becoming more and more complex, which will inevitably lead to the improvement of the comprehensive ability of the job. However, the improvement of comprehensive capabilities makes the knowledge structure of talents overlap, including their relevant work. The boundaries between technical and skilled talents are becoming blurred, that is, there is overlap of skills. We need to know that skilled personnel need to master the technical knowledge of their own specialty and be able to use it flexibly in technical work while highly skilled talents should not only have sufficient experience knowledge, but also have considerable technical principles, working principles and specialized knowledge, or we label it as theoretical knowledge. As a conclusion, highly skilled talents need not only to master the practice and technology but also to fully understand why it works best so to have a theoretical model to think about it.

2.1.1.4 Skilled talents

Skilled personnel are a special group of talents. The standard of skilled talents is not absolute, but relative, not static, but developing. According to the modern human resources theory, the so-called skilled personnel refers to people with special knowledge, skills and

professional qualities, who work for the direct benefit of the society in the production line. They mainly rely on the experience, technology, and operation skills to make the planning, decision and design of engineering talents become material forms. Skilled talents have different levels such as primary, intermediate and advanced. In China, skilled talents refer to talents who have reached 1 ~ 5 level of professional qualification in technical jobs. The skilled talents in this paper are individuals of this kind, although it might also refer to talents with skills but no certificates in the enterprises because the vocational skill identification system in China still lag far behind world levels.

2.1.1.5 High skilled talents

The term "high skill" is currently used by most countries but there is no unified definition.

High skilled personnel are human capital for organizations whose high level of knowledge and skills are input for organizational competitiveness. They can be front-line production, service and other fields and play an important part in key links because they can solve industry problems with outstanding skills. They are the core strength and outstanding representatives of all walks of life as an indispensable part of a talent team.

High skilled personnel refer to high quality workers who have the required knowledge to operate modern equipment and complete difficult or critical movements that for intermediate skilled personnel is hard to grasp in the field of production and service with strong innovation, mainly including skilled workers, technicians and senior technicians with professional qualifications.

High skill is the ability to engage in complex technology practice and solve frontier technological problems. The first factor is "difficulty in action (complexity)" and the two is "high content of technology (knowledge)". Having any of these two dimensions can be regarded as the highest skill.

The Ministry of Labor and Social Security (2008) in China points out that high skilled personnel refer to employees who work in all positions of the enterprise in all fields of work with extremely exquisite skills and skills in the key positions to solve various difficulties in

production operations.

The Chinese national professional code describes high skilled personnel as: individuals who are skilled in expertise and technology with operational skills to solve the key technical operational problems in the work practice in the production, transportation and service fields.

In *the Middle and Long Term Planning (2010-2020 years) of the Construction of the Team of High Skilled Personnel (2010-2020 years),* the high skilled talents are defined as: those who have excellent skills and exquisite techniques to carry out creative work for society, mainly including skilled workers, technicians, and senior technicians with professional qualifications. The paper adopts the concept in the planning. Due to the limitations of the evaluation of national skilled personnel and the actual situation of the development of Zhongshan industry, we regard the skilled workers with no senior high above certificates but outstanding practical abilities as high skilled people also, according to the state's spirit of talent that only education, title, qualifications, and identity are insufficient to show one's true ability. From the above experts and scholars' definition of the concept of high skilled talents and the interpretation of the meaning of high skilled talents, it can be seen that the concept of high skilled talents is dynamic, relative and diverse.

The definition of highly skilled talents can be generalized to four points:

(1) Highly skilled talents mainly include senior workers, technicians, senior technicians, and professional ranks. There are three different kinds of understanding. On the one hand, some scholars believe that highly skilled personnel refer to the so-called "skilled craftsmen" who have skilled techniques. It mainly includes advanced mechanics and technicians. Secondly, some scholars believe that highly skilled personnel should have the ability to use both hands and brain. Just as Tao Xinzhi (a great educator in China) said "Do work with hands and brain united since brain makes hands more powerful" (Dai, 2003); high skilled personnel should have a superb ability of using hands to carry out highly difficult production and processing such as make products with high precision, operate and control sophisticated and complex equipments (Tao, 1981). Third, some scholars believe that high skilled personnel are highly qualified workers who have been trained with a high level of application technology, skills and theoretical knowledge, and are creative and independent to solve key

problems (Dai, 2003).

(2) The level 2 (technician) and the level 1 (senior technician) in the Chinese national professional qualification system are relatively consistent with the international division of highly skilled personnel. Some scholars believe that high skilled personnel belong to the elites of technical workers, which are generally equivalent to the secondary and advanced professional titles in professional and technical posts. Only technicians and senior technicians can match this level; senior technicians belong to technical personnel (Li, 2001).

(3) The third point of view is that highly skilled talents are a historical and developing concept. The concept of high skilled talents is always relative to the initial, intermediate skilled talents according to certain historical times. With the development of the industrial structure, the development of science and technology, the extension of the high skilled talents will increase, and the connotation will be promoted. The high skilled talents may not be defined extremely by the way of division of professional titles and vocational qualifications. For example, technicians and senior technicians who master expertise and operation skills should also have some organization and coordination capabilities (Tang & Song, 2006).

(4) The fourth point is that high skilled personnel not only has profound basic theory and professional theoretical knowledge, but also high production skills to undertake operation tasks with high techniques. They not only have the comprehensive skills to use cross technical knowledge to solve practical problems, but also have high professional quality and professionalism (Lang, 2006). From the different description of high skilled talents, we find that the modern high skilled personnel not only needs high production skills, but also has to have profound theoretical knowledge, not only in order to complete the complex technical operation but also to have a certain coordination and organizational ability. They need not only to learn and accumulate existing skills, but they also need certain technological research and innovation capabilities. At the same time, highly skilled talents are a historical and developmental concept. Every era has high skilled talents in that era. With the development of science and technology, the connotation and characteristics of highly skilled talents will change (Lan & Deng, 2007).

To sum up, the concept of contemporary high skilled personnel should be: "those who

can carry on the difficult production processing, including producing with, operating and controlling complex equipment, installation and debugging and maintenance of complex instrument and so on so that they can integrate modern technology with experience and technology, namely talents with knowledge and creative skills to use both hands and brain. This group plays an irreplaceable role in social production as direct creators of real productivity

2.1.2 Structural Level Elements of High Skilled Personnel

At present, research about the characteristics of highly skilled talents can be summarized as follows:

2.1.2.1 Division of the Capacity Level of High Skilled Talents

The Capacity level of the "high skilled talents" can be divided into three types: primary, intermediate, and advanced (high) skill. "High skill" is a relative concept referring to skill level rather than type comparing to primary and intermediate skill. There are different levels of skills in any industry in any area, whether in traditional industries (such as construction) or in emerging high-tech industries (such as integrated circuits). Primary skills refer to specific tasks or problems, if the individual reaches a specified goal under a given condition through a certain process of operation according to a standard, we can say that he /she has the primary skill of this profession. Primary skills are inadequate and must be further improved. Intermediate skills means when the subject is not only able to fulfill the task in conformity with the requirements but also gradually become proficient to achieve higher level of operation under normal conditions, and can operate smoothly without much consciousness or attention, i.e. with automation. However, intermediate skills are still task-oriented because the enlarged or reduced task scope, the raised requirements or the changed operating conditions will make the individual hard to adapt. If intermediate skills are the ability to accomplish routine tasks, advanced skills correspond to the ability to further accomplish complex technology tasks. A common feature of high skill is to break through the general constraints of human information processing, and to begin processing the information considering the next operation before completing the operation based on the previous stimulus, thus breaking

through the restriction of the non-parallel (or alternation) information processing (Sternberg, 1996).

2.1.2.2 The Structure Hierarchy of High Skilled Talents

The structural level of "high skilled talents" comprehend three types: technical, knowledge, and compound skilled talents. Professor Chen Yu, the director of the Professional Skills Identification Center of the Ministry of Labor and Social Security, divided the "highly skilled personnel" into three types (Chen, 2004): "high skilled personnel are the appellations of the middle layer between operation execution layer and the executive management level." In the process of economic development, the high skilled group, which includes technical skills, knowledge based skills and complex skills, has been playing an increasingly important role in social and economic activities as the main force of social production, the support of social wealth, and the backbone of social stability ". Mr. Liang has divided high skilled talents into two parts: first, skilled talents who have advanced professional titles in 'specialized talents', even though they have not got senior titles, have reached advanced level of expertise when their skills have reached the advanced level; secondly, talents who are recognized as skilled talents in 'outstanding talents' or even unofficially recognized as an outstanding talent with their outstanding skill level (Zha, 2007).

2.1.2.3 Collars of High Skilled Talents

The collars of "high skill talents" "can be divided up as "gray " or "silver". At this stage, people often refer to workers engaged in management and decision-making as "white-collar". Workers engaged in specific operational work are called "blue collar". High skilled personnel are called "grey collar", or they are called "silver collar", as they stand between management and operational workers. In Shanghai the high skilled talents are called "Grey Collar" while in Shenzhen they are called "senior blue collar"). As far as "grey collar" is concerned, the relevant people of the Shanghai labor security bureau say that "grey collar" refers to skilled personnel with a high level of knowledge, a strong creative ability, and a master of skills. To put it simply, they are a compound of skill talents using both brain and hands (Liu & Ma, 2006]. The Minister of Education Zhou Ji stressed at the third exchange meeting on production, learning and research of the national higher vocational education that: "this kind of talent is neither 'white-collar' nor 'blue collar', but 'applied white-collar' or we say 'silver collar' (Zhou, 2004).

2.1.2.4 The Constituent Elements of High Skilled Talents

From the elements of skills of high skilled talents, they are divided into three kinds: knowledge, skills, and creativity (Figure 2-1). High skill requires high motor skills and intelectual skills. Knowledge (explicit knowledge and implicit knowledge) and skills are the foundation while creativity is the source of high skill.

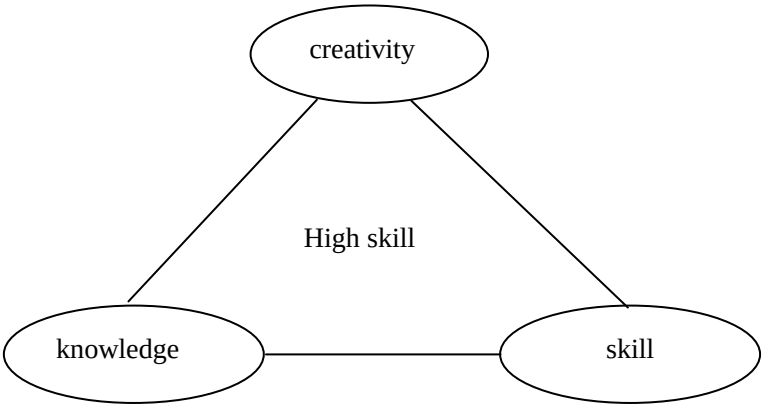


Figure 2-1 Components of high skill

Knowledge is mainly embodied in rules of thumb, process methods and ineffable understanding. Steinberg, a famous psychologist, pointed out that knowledge is the foundation of creation, and nothing can replace it (Yuan & Chen, 1985). It mainly includes three aspects: 1) the general and specific knowledge of the object that the individual wants to change; 2) the principles, methods and knowledge to be used to realize a certain technology, and 3) the knowledge of how to make, operate or use some material means in practice which can be divided into implicit empirical knowledge and explicit theoretical knowledge. Skill is the direct basis of skill activity. In the practical operation of the skill acquirer, there are two levels of activities: physical activity, and mental activity. Body activity is carried out under the control of the brain. The individual uses the known operational knowledge and experience to improve the coordination, flexibility and accuracy of the movement through repeated operation. In the process of practical operations, according to the individual's feeling and perception of the operation, through the use of existing knowledge, the individual makes continuous instruction on the body activity, and then he/she analysis it immediately and judges the results of the activities. This is what is meant by "Mental activity". The operator will gradually combine the existing knowledge in the brain with the specific operations so that they can interact and form a perception and experience-based knowledge for specific operations. Physical activities and mental activities are integrated into the same operation process, and the two promote each other. Creativity refers to the psychological quality that

human beings need to accomplish certain novel activities successfully, and the ability to generate new ideas, discover and create new things. For example, creating a new concept, a new idea, renewing technology, inventing new devices, new methods, and creating new works are all manifestations of human creativity. It is mainly manifested in three aspects: flexibility, fluency, and uniqueness (Snyder, Mitchell, Bossomaier, & Pallier, 2004).

2.1.3 Structural Level Elements of High Skilled Personnel

From the professional and individual characteristics of the group, the characteristics of the high skilled talents capacities are typically embodied in the high hands-on ability, the outstanding creativity, the strong adaptability and autonomous behavior.

2.1.3.1 High Hands-on Ability

Hands-on ability is a common feature of all skilled talents. Hand is both product and organ of labor. When establishing the modern vocational education, Mr. Huang Yanpei set the motto as " with two hands, one can work miracles", aiming at training all kinds of hands-on workers in the industrial sector.

The gradualness of growth and the pertinence of the position. The growth of highly skilled talents is closely related to the practical training of front-line positions. After leaving the post production practice, highly skilled talents are unlikely to emerge in large numbers. Skill is the specific requirement of the practical post so to become a highly skilled person it is necessary to learn from the practice of the post and gradually accumulate experience, master the skills and improve the skills. The gradualness of skill upgrading determines that the growth of highly skilled talents is completed step by step in the practice of work. It experiences from the "novice" to "expert" to "hand" and "expert" of the gradual process of ascension. Therefore, the training of highly skilled talents must be closely combined with production and practice in the front line.

A highly skilled practitioner can successfully complete all the tasks in the career field from simple to complex, from conventional to abnormal with the same high performance and at ease. Whenever there are technical problems that no common workers can solve, the senior skilled talents can deal with it quickly and effortless. So only high skilled talents can wear the crown of "excellence in skill", which is also the most significant professional image feature of highly skilled talents, also known as "craftsman spirit".

With the progress of industrial civilization and the quickening privatization of labor

force, the intellectual degree of skills is more demanding. Hands-on ability does not only refer to the traditional "handicraft" and some "unique skill", but also the alliance of "hand and brain" gained through skill education and training to acquire modern theoretical knowledge. This "hand brain alliance" will be the special feature of high skilled talents of knowledge societies. The advance lies in the high mental level of handicraft and unique skill and the integration of hand and brain capacity.

2.1.3.2 Outstanding Creative Ability

Creativity is the common feature of all talents. The creativity of high skilled personnel is mainly manifested in the innovation ability in the relevant technical fields. They can complete any tasks smoothly and freely within the scope of the profession given improved requirements, changed conditions or extended operation, such as technological innovation, technological improvement, process reform and invention creation. Primary and secondary skilled talents mainly master skilled technology and engage in repetitive skilled labor of motor skills. While high skilled talents have mastered precision technology more, engaged in more complex mental skills, and most of them have rich and special knowledge, skills and experience.

The creativity of senior skilled talents is also personalized. Classical psychologist Raymond Cattell and others believed that people with strong creativity are intelligent and talented, strong and stubborn, serious and prudent, brave, imaginative and frank (Barron & Harrington, 1981) especially after a determined threshold in IQ (Jauk, Benedek, Dunst, & Neubauer, 2013). These characteristics are the results of long time practice in the production, service and management. They belong to good psychological qualities of the senior skilled talents who are rich in creative ability.

Highly skilled talents integrate scientific knowledge, working and operational skills. High skilled personnel can not only use all kinds of labor tools skillfully, but they also have the ability to apply the knowledge and skills they have learned, to improve or design and invent new labor tools. As stated, highly skilled talents are able to use both hands and brains. They are knowledge skilled talents or skilled talents with innovative skills. Technology, creation and innovation are the characteristics of the highly skilled talents in a knowledge society which distinguish highly skilled talents from other talents.

2.1.3.3 Strong Adaptability

Modern high skilled personnel have strong adaptability. It is mainly manifested in their living activities and strong on-site adaptability.

The types of high skilled personnel are diverse, including technical and skilled talents with skilled craftsmen in all walks of life, knowledge-based talents with specialized knowledge and high technology, as well as composite skilled talents with cross knowledge and a variety of different skills. However, knowledge, technology and skills in different periods have different meanings. With the adjustment and upgrading of the industrial structure and the development and change of science and technology, the standard of high skilled personnel will also change accordingly

We must firstly consider that as industry and science evolve so must the standard of a high skilled individual evolve concomitantly. Adaptability is thus a core feature. Highly skilled talents have strong knowledge transfer and social cognitive ability. The so-called knowledge migration ability means that when encountering new things they can combine the systematic knowledge and practical skills with the perceptual knowledge of the emerging things observed so that they may use the methods of knock, contrast, induction and deduction to transfer their own knowledge to the emerging things to achieve the goal of gradually understanding it. The individual cognitive ability means that the high skilled talents have enough awareness of their own abilities, while the social cognitive ability refers to the ability to understand and adapt to the current situation and development of the society. So, besides knowledge adaptability, high skilled talents also have knowledge transfer adaptability.

Such individuals have strong adaptability and can grasp theoretical knowledge relatively well, and can adapt well to the renewal and transformation of technology (Ding & Dong, 2007). This adaptability is not only manifested in the flow of the jobs of the same profession (work), but also in the flow of jobs in the neighboring specialties. It shows a higher tendency to flow because highly skilled people have special knowledge, skills and experience so they are pursuing better treatment and welfare for long-term development. In contrast, the job adaptability of primary and secondary skilled talents is far lower than that of highly skilled talents. This adaptability reflects not only their rich and solid scientific theoretical knowledge and experience accumulated in working practice, but also their operational skills to accomplish thousands of tasks, strategies to cope with a wide variety of unexpected situations, and the potential to make major decisions or accomplish important tasks. At work, all kinds of tasks are always treated with positive attitude and behavior, which can lead them to be in a good position in the broad professional field.

Overall, adaptability is a core feature of high skilled talents and it is manifested as adapting to new knowledge (extracting the patterns to infer theory), adapting to transfer

knowledge to new situations (generalizing existing knowledge to understand new situations), and adapting to positive attitude towards work novelties (being predisposed to tackle changes in a positive way).

2.1.3.4 Strong Autonomy Ability

High skilled personnel also have the characteristics of individualization. Manual products are instantly authentic, non-replicable, unique with a strong sense of identity which far better than machine products. Because of their rare skills, they often need more autonomy and space than ordinary employees. They need flexible salary systems, humanized and flexible management. They can accept and learn new knowledge. High skilled personnel are required to improve their ability to accept new things and study by themselves so to a certain extent the development and utilization of intelligence is a dominant factor. The integration ability of knowledge system requires the skilled personnel to make appropriate induction, collation and systematization from their knowledge base. As we call it, the systematic integration of knowledge offers the advantage and timeliness of workers' use of labor tools. High skilled personnel can not only master the corresponding theoretical knowledge, but also have strong practical operation ability. In the industry they are responsible for the tasks with high technical content (Zhang, 2013). The most important feature of highly skilled talents is to transform the latest theories and technical requirements into the best products, services, management and benefits (Chen, 2004). It can be thought that highly skilled talents are the direct carriers of real productivity and the direct creators of social wealth.

2.1.4 The Role of High Skilled Personnel

The role of China's senior skilled talents is mainly reflected in the following ten aspects in production, work, art, and life.

(1) the backbone of production. High skilled personnel persist in working in the line of production and work, solving various difficult problems in production in time, producing high quality products, and making great contributions to improving labor productivity, saving money and improving economic efficiency.

(2) the core force of technology. Highly skilled talents can achieve new technological product processing with high accuracy, difficulty and ensure their quality with superb skills.

(3) the leading role in the post. The high skilled personnel love and respect the job, stick to the post, as long as the production and work needs they always come forward to meet the

challenges for the completion of the production and tasks.

(4) the role of innovation. In order to improve production and work efficiently and improve the process, highly skilled personnel often innovate the tools of labor, produce higher, updated products, and adhere to the high sense of responsibility and dedication of the masters to achieve technical innovation and technological transformation.

(5) the role of the craftsman. High skilled talents can find and solve problems in time on product quality or equipment failure. Sometimes they are bold and innovative. Some of them dare to open devices they are not familiar with and be brave enough to face world challenges. Some have won the "Invention Gold Award" of the countries concerned in the world, even have developed the technology "reverse transfer" to the developed countries.

(6) the role of the art teacher. To make young and middle-aged employees learn skills fast and well, high skilled talents are willing to teach skills without reservations in person. Some of them train intermediate skilled workers so that they can grow up as soon as possible and contribute more to the country.

(7) the exemplary role of compliance. Highly skilled personnel are a role model in the production and work for young people.

(8) the role of example in learning. The high skilled talents set a good example to the young and middle-aged employees in various aspects as the political thought, professional ethics, the skills and knowledge of the social ethics, the spirit of pioneering and innovation.

(9) the role of the management. High skilled personnel can put forward practical opinions and suggestions on how to further strengthen management, and also participate in the management and decision-making of enterprises through staff representative meetings and other forms and channels.

(10) the role of tutoring in life. Senior skilled personnel can play a role in guidance for the young and middle-aged employees with their own years of life and experience.

2.2 Human Resource Theories

From a Human Resources perspective, highly skilled personnel, or talents, have been studied from several points of view. This section lists and explains the main topics related with talent management.

2.2.1 Human Resources

Human resources refer to the total population with certain ability to work engaging in economic activities. The economic and social development of a country or region must be supported by resources both natural and human. However, natural resources must depend on human labor to make use of them. Therefore, the amount of natural resources is very important for the development of a country, but the state of human resources is more important for the development of a country (Barro, 2001).

It is for this reason that often in management literature the development of the economy and society is seen as depending mainly on the human resources of the country because natural resources need to be turned into social wealth by human resources. The competition in the world is, in the final analysis, the competition of human resources and the competition of talents (Cerna, 2016). Therefore, a country's comprehensive national strength is not in its natural resources, but instead in the human resources of this country. That is why countries strive to develop their human resources.

The development of human resources is intended to improve people's ability to understand the world and transform the world through a series of activities such as education, training, use and motivation.

Overall, it has become generally accepted that the most critical and influential factor in all sectors of the world's economic and social development is human resources. Human resources are the most important resources in a country. The development of human resources and the great improvement of human resources can not only reduce the dependence of human resources on natural resources, reduce the consumption and waste of natural resources, create more resources and wealth, but also promote the overall development of human beings and promote the economic and social coordination.

The development of human resources has always been highly valued by civilizations that became successful. As urbanization grows in China, so the development of regional economy in small and medium-sized cities must rely on the support of high-quality human resources. The development of human resources is dominant, which can make up for the shortage of

natural resources. Therefore, in the process of strengthening the construction of high skilled personnel, the "13th Five-Year" plan promoted the economic and social development and attached great importance to the development of human resources from a strategic point of view. As states a Chinese proverb attributed to Kung Tze (Confucius) “If you are planning for a year, plant rice. If you are planning for ten years, plant trees. If you are planning for a lifetime, educate the people” shows that China has always placed a great value in education.

2.2.2 Human resource integration

Integration has the meaning of "adjustment and integration", which means structural adjustment and system integration, from disorder to order, from contradiction to unity, from imbalance to equilibrium, so that the system can maximize its function and achieve its goals. At present, there is no consistent definition of human resource integration in academia. In the book of human resources integration of enterprise performance, Professor Luo Jinlian defines the integration of human resources as follows: human resource integration is to guide the objectives of the members of the organization and organizational goals in the same direction to improve the behavior norms of the members and improve the performance of the organization.

According to this definition and research ideas, the integration of human resources in small and medium-sized cities is described as: at the strategic thinking level, the integration of human resources is the way of thinking of system theory. It is because of the existence of regional idle, scarce and mismatched human resources, and so on that some people are not in good place. From the demand of market talents, through organization and coordination, continuous improvement and perfect mechanisms have been put in place to achieve the optimal allocation ratio of regional skill talents so that the effect of skilled talents group on regional economic development can be achieved which just like the equation 1+1>2. In the tactical selection level, the integration of human resources is the decision of optimizing the allocation. It refers to systematic engineering of structural optimization and reorganization by means of testing, evaluating, training, motivating and planning, so as to tap its potential.

2.2.3 Talent Development

The development or management of talent in an organization combines a series of activities, such as resource allocation, quality improvement, ability utilization, development planning and benefit priority, to fully, scientifically and rationally play the active role of talents to the social and economic development. This connotation can be explained as follows: by “fully” one means to achieve full employment in quantity; by “scientifically” one means the use of scientific theories and methods to develop talents; and by “reasonable” one means that the use of talent cannot be done by robbing, but by developing in the long-term looking for sustainable benefits.

Through the means of education and training, organizations endeavor to improve the quality of all aspects of talents in an all-round way, so the positive role of talents to the social and economic development can be played avoiding negative effects. This can be guaranteed if the talents are put into the appropriate posts, so that "the capable person and the sage are in their proper position". The talent development activity gives priority to the efficiency of input and output which means greater benefits can be achieved with smaller investment. So, according to the model and policy of talent development, China needs to evaluate the situation of talent development, predicting and balancing the supply and demand of talents, and making talents ability be best applied within an optimized structure through various means of configuration, flow and incentive.

Overall, there are three levels of talent development: cultivation, application and policy development. The goal of talent development activities can be simply explained by a formula: talent contribution = talent intelligence + talent vitality.

2.3 Skill Formation Theory

This section explores the theories sustaining skill development as well as related topics.

2.3.1 The Characteristic Theory of Enterprise's Work Knowledge

2.3.1.1 Working Knowledge and Its Types

Working knowledge is the functional knowledge that fits the situation of the enterprise and has the value of improving the productivity level. It is the knowledge of professional theory, practice process, experience method and equipment technology. Work knowledge is divided into factual knowledge, method knowledge and value knowledge.

2.3.1.2 The Characteristics of Working Knowledge

From reviewing literature, we found eleven features attached to working knowledge. First, transferability. Knowledge transfer includes the transfer and accumulation of knowledge. As an important production factor of an enterprise value creation, working knowledge can be transferred to human capital, and be transmitted and received in the internal and external organizations of enterprises in different times as valuable resources to accumulate as new knowledge (Reed & DeFillippi, 1990). Second, complexity. It needs to overcome complex uncertain factors to disseminate the interpretative information of the knowledge by various information carriers such as words, charts and languages and working knowledge receive needs to invest more and more resources to understand relative information, all of which make it becomes more and more complex and difficult to transfer working knowledge. Third, implicit. Implicitly means that it is difficult to express and disseminate knowledge in explicit ways like words and language so it needs to be learned and inherited by experience and practical operation. The implicit nature of working knowledge is mainly demonstrated in the technical and cognitive aspects. Fourth, systematics. It means the close connection and relationship among source knowledge, transferring knowledge and related fields and if working knowledge becomes more systematic, there will be more linking areas involved with broader transfer space expanding. Fifth, integrativeness, or integration of working knowledge. It refers to the overall development of the continuity of sensibility and rationality, combination of theory and practice and the integration of purpose and process in the people’s activities. All kinds of teaching forms in schools and enterprises need to be integrated with "direct behavior" and "content of emotional reaction". Sixth, interactivity. Learning of working knowledge involves the interaction between human and environment as subjects and

objects respectively. In the process of obtaining work knowledge, the subject transforms and creates the knowledge which becomes the starting point of the next "exploration" cycle, so the work knowledge is the recognition and wisdom gained by gradual exploration. Eighth, practicableness. Working knowledge is the exact understanding and recognition that people have acquired in exploration of the objective world. Practical action is an important activity of knowledge acquisition because work knowledge needs to be combined with action. Ninth, situational. Work knowledge needs to be interlinked with the learners' existing life experience to co-construct with surrounding situations. Tenth, individualism. Working knowledge is a participatory process of individual seeking truth. Individuals have different work knowledge experience for their own different attitudes and experiences. Eleventh, instrumentality. In the experiential and introspective thinking activities of human beings, working knowledge is a rational tool to promote the development of people and society and has the effect of changing the results of things (Dewey, 1989)

2.3.2 Theory of Successful Intelligence

2.3.2.1 Concept of Successful Intelligence

Intelligence is the mental activity that an individual adapts to, chooses and reconstructs the real world. Since Spearman put forward the earliest intelligence theory in 1904, the development of intelligence theory has always been closely related to the growth of talents. In 1996, Sternberg, a professor of psychology at the Yale University, proposed a theory of successful intelligence and made a systematic explanation in his book "successful intelligence" (Michael, 2000). The concept is like this, “Used to achieve the main goals in life, intelligence enables individuals to target at goals and take corresponding actions "(Sternberg, 1996). That is to say, successful intelligence is a capacity that indicates future life and helps individuals achieve life and career success.

2.3.2.2 Elements of Successful Intelligence

First, successful intelligence should be defined according to one’s ability to achieve life success in a social and cultural background by his or her own standards. Second, the ability to achieve success depends on one’s own power to correct or make up for shortcomings; third, success can be gained by balance among three aspects of analysis, creation and practice. Fourth, intelligence balance aims at adapting, shaping and selecting environmental goals, not

just to adapt to environment as a traditional view of intelligence.

2.3.2.3 Type of Successful Intelligence

Sternberg divided successful intelligence into three types: analytical intelligence, creative intelligence and practical intelligence. Analytical intelligence is the conscious determination in the direction of mental activity with the ability to analyze, evaluate, judge, compare and contrast things which can be measured by traditional intelligence tests. When solving individual problems (including six steps of problems confirmation and definition, strategy for problems solving, information representation, allocation of resources, monitoring and evaluation), the main purpose of analytical intelligence is to overcome many obstacles to reach solutions from the real situation. Analytical intelligence is essentially an individual's ability to think accurately as a good method to find ways to solve problems. Creative intelligence is the ability to transcend the all ready known content, produce novel and interesting results which can produce new ideas in the face of new tasks and situations. Individual creative intelligence mainly includes imagination, hypothesis, conception, creation and invention, etc. Practical intelligence refers to the ability to use the results of thought and analysis in an effective way in daily life, to transform the theory into practice and to transform abstract ideas into practical results, and to apply experience to the adaptation, building and selection of the environments. The core of "practical intelligence" is tacit knowledge. Practical intelligence is embodied in the abilities of demonstration, display, operation, use and application and so on.

Successful intelligence is an organic whole. Sternberg pointed out that "it is the most effective only when we coordinate and balance the three aspects of analysis, creativity and practice ability. It is more important to know when and by what means to use three aspects of successful intelligence than to just some of these qualities. (Sternberg, 1996). Only by attaching importance to and developing meta-cognitive ability can we develop intelligence fundamentally.

2.3.3 Theory of Professional Ability Formation of High Skilled Personnel

2.3.3.1 Longitudinal Continuity of Capacity Formation

The continuity of the formation process of the professional ability of high skilled personnel means that the formation of professional ability is not accomplished overnight. It follows the regularity of the ability of survival, growth and generation as a vertical developing

orientation of the professional ability. Besides, there is microcosmic continuity in the formation of occupational capacity at a certain level. At the same time, it needs to improve the accuracy, stability, flexibility and agility of the action when a procedural understanding of movements of each link in the mind has been formed and motor and technical skills are further promoted by use of both hands and brains.

2.3.3.2 Lateral Mobility of Capacity Formation

The mobility of the professional ability formation of high skilled personnel means that the development and formation of different skills and abilities require a grasp of other abilities. The past knowledge and experience, conscious learning and ability reconstruction make related genes migrated each other to realize the mutual promotion of abilities. That is, the mobility is accumulated by high skilled personnel through the post task experience first, and then the high skilled talents develop it through professional situation, thus forming a healthy expansion of knowledge structure, ultimately forming a high-level professional ability gradually

2.3.3.3 The Influence of Production Technology Progress and Industrial Structure Adjustment.

From the macro level of industry, the formation of professional ability of high skilled talents is promoted and influenced by the progress of production technology and the adjustment of industrial structure. Highly skill-biased industrial technology provides a good developing condition for high skilled talents since the progress of production technology has advocated highly skilled skewness and the adjustment of industrial structure has a positive effect on the development of high skilled talents' professional ability.

In addition, the abilities formation of high skilled talents also has multiple characteristics such as cross-developing, hiding and periodical.

2.3.4 Craftsman’s Spirit

2.3.4.1 The Concept of Craftsman’s Spirit

Jiro Ono, the 86-year-old world-renowned Japanese sushi master noted that “Once you decide on your occupation, you must immerse yourself in your work. You have to fall in love with your work. Never complain about your job. You must dedicate your life to mastering your skill. That’s the secret of success and is the key to being regarded honorably.” Dean Kamen, one of America’s best-known contemporary inventors, remarked: “the principle of

tinkering – taking the available technology and assembling it to solve problems and create solutions and thereby create real wealth – is not only part of this country, but it is the essence of what made this country viable". To put it simply, anyone who comes up with a good idea and makes efforts to realize it can be called a craftsman (tinkerer). Historically, American craftsmen were a relatively eclectic bunch who hatched extraordinary, life-changing innovations by sheer will and forward momentum. America's craftsman tradition has always been a key part of its ongoing greatness. Craftsmanship has three basic connotations: firstly, making something genuinely new out of the things that already surround us; secondly, it is something that happens without an initial sense of purpose, or at least with a purpose different from the one originally identified, and it also emanates from a place of passion or obsession; lastly, it is a disruptive behavior in which the craftsman pivots from history and begins a new journey that results in innovation, invention, and illumination..

2.3.4.2 The Characteristics of Craftsman

What are the characteristics of craftsmen? They are smart and immersed in the world but not necessarily trained in a specific field. They may be affiliated with large corporations or institutions, but they rarely fit in due to their desire to pursue their own interests.

(1) Attitude of working simple things to perfection. Abandon the greed for power and the idea of impatience and speculation. Regard your dream as a belief and improve the profoundness of life with this belief. Start with your love of job and do one thing at the cost of your lifetime. Persist with simplicity. Focus on product procedures, forms, brands, quality with professionalism. Work finely in every moment to bring it to perfection, and "practice simple acts to perfection to be a unique skill and miracle".

(2) Ambition to grow small ones into bigger and stronger. Once you decide on your occupation, you must put every effort into your work and show your spirit in every detail. Work finest things to perfection and always pursue higher perfection, without complaint, striving forward, without retreating, to the direction of growing "bigger" and "stronger".

(3) Persistence in doing one thing well throughout the lifetime. Set up the "work attitude" of belief, value and conscientious work. Love your job, stick to it, respect it and make creations. Observe rules and work conscientiously. Spend your lifetime on it, whether it is big or small, to achieve huge success. An example is the craftsman Li Chun in China's Sui Dynasty, whose Zhaozhou Bridge has stood intact for over 1400 years. Lu Ban, in China's Period of Spring and Autumn and Warring States, made inventions in machinery, civil works

and handicrafts. America's RAND Corporation spent 20 years tracing 500 big companies globally and discovered that century-lasting companies share one common characteristic: human values are higher than material values, collective values are higher than individual values, social values are higher than profit values, and user values are higher than production values.

(4) Work pursuit of constantly striving for perfection. Craftsman's spirit is an obsession with work and constant striving for perfection in tasks and products. It requires skillfulness in exploring, seeking methods to achieve perfection, delicate carving in products and unwavering pursuit for excellent products as well as perfection and immortal value. Problems last for a lifetime and their values lie in solution. Pursue special-featured effects of "skillfulness", "familiarity", "ready solutions", "great ease", "uncanny workmanship", "preparedness" and "acme of perfection". Put your heart and soul into every task to reach the acme of perfection and uncanny workmanship.

2.4 The Theories About Skill Levels

2.4.1 Social Stratification Theory

The sustainable development of the society promotes the laborers to engage in different social posts, that is, to undertake certain professions at different levels, positions with salaries differently. Social stratification emphasizes the necessity of the plan of the talent training aim

The standard of social stratification. The formation and starting point of Webb's social stratification theory is different from Marx. It stresses the three standards for the division of the social hierarchy: Wealth - economic standard, prestige - social standard, power - political standard. The importance of wealth and power in personnel training is self-evident. Als,o the pursuit of "prestige" cannot be ignored as there are many sayings about it, such as "Leave behind a good reputation" or "Wild goose keeps sound too". The so-called social standards, "prestige", are the recognition of the individual in the society which also depends on the evaluation of others. It is determined by the identity of the individual, the degree of education, the way of life and so on.

Labor division in social stratification. Durkheim put forward the term of "labor division in society" to analyze the stratification. He stressed the unity and integration of the society, the division of the profession, and also talked about the social inequality caused by the labor

division.

The social stratification theory, to a certain extent, emphasizes the positive role of the social division of labor, and believes that social stratification is bound to appear to a certain extent if the whole society is operated normally. The more important a profession is, the greater the social remuneration of this profession; the higher the level of technology a profession requires, the more training necessary with more social remuneration gained.

2.4.2 Labor Market Segmentation Theory

In the early 1970s American economists Peter Doeringer and Michael Piore studied the salary gap in the labor market and concluded that there are two markets: 1) In the first class market, the workers in the first level market can get more social rewards with more comfortable working environment and low competition so the workers have more opportunities to participate in the professional skills training with reasonably career plans. 2) In the second market, workers have low wages and welfare with no better working environment and more fierce competition, and most of them are engaged in manual labor with little opportunity for vocational training and promotion in their career (Doeringer & Piore, 1971). According to the theory of labor market segmentation, the degree of labor market segmentation is one of the important signs to measure the development of labor market. The labor market is not a continuous entity, but a combination of sub divided labor markets. It has basic theoretical value of the division of training institutions.

2.4.3 School Level Theory

Training institutions that can carry out vocational skills trainings include technical schools, vocational training institutions, and short-term skills training institutions, and so on. These institutions and schools belong to different school levels for the following reasons from three aspects.

First, the government hopes that the school has its own unique characteristics so that students can adapt to the diverse social labor division in the talents training.

Second, there are some differences between study and school to a certain extent.

Third, the demand for diverse talents in the labor market decides the existence of different schools because the purpose of cultivating talents in schools is to provide talents to meet the requirements of social development. So, the relationship between survival and development of the school and the demand for talents is mutual influential and interrelated, which results in the classification of schools.

The social stratification theory, the labor market segmentation theory and the school level theory all together play a basic role in the construction of high skilled personnel training mechanism and have a high guiding value for the practice research. They also laid a theoretical foundation for the cultivation of various types of high skilled talents such as applied talents, pragmatic talents and technical talents.

2.5 Related Theories of Skill Production

2.5.1 Romer's Endogenous Economic Growth

In 1983, Paul Romer summed up some theories of economic growth, mainly referring to capital, unskilled labor, human capital and new ideas. There is core idea that progress in science and technology or new ideas are important factors of economic growth. The progress of science and technology, and the increasing investment of other factors such as capital and labor directly lead to the steady growth of the whole economy, thus ensuring the sustainability of economic growth.

2.5.1.1 Three Elements of Romer's Growth Theory

Romer (1983) believed that the hypothesis of the diminishing marginal returns makes the neoclassical growth theory fail to work effectively, so he gave up this hypothesis in his new growth model. First, Romer’s theory stated that knowledge is different from capital in economic growth since it is produced by research technology of diminishing return on model returns; secondly, it has external positive effects on knowledge investment; thirdly, the production of consumer goods as a function of knowledge and other inputs has an increasing returns to scale. Externality, increasing returns to scale in production and diminishing returns to scale in new knowledge production are three elements of Romer's growth theory.

According to these elements, Romer's growth model has achieved the internalization of technological progress.

2.5.1.2 The Two Aspects of Knowledge Progress

In his theory of endogenous growth Romer (1983) holds that besides two production elements of capital and labor, there are also two other factors of human capital and technical level. Labor included in the model refers to unskilled labor, while human capital refers to skilled labor, and if human capital is represented by the length of educational time, such as formal education and on-the-job training, the role of knowledge or education in economic growth is considered. Romer sustains that the progress of knowledge is embodied in two aspects: on the one hand, it is the proficiency of the workers, which is expressed with human capital in the model; on the other hand, it is the technological advancement in the material products such as new equipment and raw materials. It is expressed with the skill level in the model.

2.5.1.3 A major Factor in the Economic Growth

Romer (1983) also believed that the new knowledge created by enterprises is the main factor of economic growth. Knowledge as a special production factor, its own production has diminishing returns, but it has increasing returns in output production. Besides, knowledge are also external things created by an enterprise which will become public knowledge and benefit other enterprises. As long as enterprises achieve optimal control of knowledge production, the economy will achieve long-term stable growth.

The Romer model abandons the hypothesis of the diminishing marginal returns of the neoclassical economic growth theory and puts forward a knowledge spillover model based on knowledge production and spillover. In knowledge form, knowledge is the main factor to create wealth for human beings and will increase with high utilization rate (Hu, 1996). The emergence of this theory has realized the idea of long-term increment people desire to have for long time which has initially formed the theory of sustainable development of economic growth.

2.5.2 Transaction Cost Theory

Transaction cost theory is also applicable to the cultivation of highly skilled talents. The process of talent training is essentially a cooperative contractual relationship between training units, employing units and training objects. In the process if the internal transaction cost is lower than the outside, the enterprise will choose to use the internal transaction. For example, when the cost of cultivating talents by external cooperation is too high, the enterprise is more inclined to choose internal training; on the other hand, enterprises will choose external cooperation if the cost is low. For any party in the contract relationship, if the transaction cost is low and the income is high, then the contract will naturally be fulfilled. On the contrary, if the transaction cost is high and the income is low, the enthusiasm for the training of skilled personnel may be greatly reduced.

It can be seen that the transaction cost will directly decide the behavior choice of all the training subjects, and then will be related to the success or failure of training skilled talents. In the course of the actual operation, the conflict of interests and transaction costs produced in reconciliation result from unawareness of knowledge and information between the participants, the transaction costs may be even larger if this asymmetry is used by chance.

Therefore, it needs to pay great concern to policies for reducing transaction costs, formulation of rules for contracts, and improvement of the ideology of all parties.

2.5.3 Theory of Combining Education With Productive Labor

Based on school education, Marx emphasizes the combination of teaching and labor which means even school students should participate in the necessary productive labor. Marx's thought of "teaching labor" is closely integrated with the theory of "reeducation through labour". The former is the development of the latter, and the latter is the ideological basis of the former.

Lenin also held the theory of combining education with productive labor. He believes that school education or productive labor solely may meet the requirements of the development of modern science and technology. The realization of ideal society depends on the combination of labor and education (Central Compilation & Translation Bureau, 1959).

Mao Zedong's theory of combining education with production practice. In this theory he has put it into practice in some ways. In 1958, when he visited the Tianjin University, he pointed out that the "school run factory, the factory run school" to promote the combination of education and labor. In the same year, the "combination of education and production labor" was established as the party's educational policy. In this period, under the guidance of the party's educational policy, the university has made clear the direction of the combination of schools and factories, the combination of students and workers, the combination of educational work and production (Party History Research Center of the CPC Central Committee, 1992).

Deng Xiaoping's theory of the combination of education and labor inherits and develops the combination of education and labor macroscopically and microscopically. Deng Xiaoping stressed that in order to better carry out the combination of education and production, the school should make appropriate arrangements for the type of labor, time and place of work (Wang, 2006). At the macro level, Deng Xiaoping stressed that in the process of combining education with productive labor, we should pay special attention to the adaptation of the whole education to the development of the national economy. If the students' study cannot be applied into the career in future, it is in vain in the end

2.5.4 The "Learning By Doing" Theory

It refers to the way of learning that study and work together in the practical job without formal education and training to help learners to absorb the knowledge and internalize their ability. It is of great significance to obtain direct professional experience and construct professional ability. Its income is mainly manifested in two aspects, on the one hand, the ability to improve the professional knowledge, skills and experience of the staff, and the spillover effect of human capital which may make the positive contribution to the production factors outside the investment. On the other hand, the productivity and production efficiency can be increased, and the ability to attract human capital are also promoted.

The way of "learning by doing" is the integration of work and study. It requires mature and perfect job conditions, behavior environment requirements and learning facilities. First,

the tasks of high skilled personnel have a certain integrity and degree of freedom, and they can suspend work at any time to study, without affecting the work process of other links. Second, the working environment of high skilled personnel should have study medias such as technical data, computer equipment, and professional personnel, communication with professionals and so on.

There are two ways of "learning by doing". First one is integrated learning. It refers to the integrated learning method in the job position. The learning process needs to integrate the time and space of work and study. That is, time can be intersecting while place can be fixed which belongs to the category of individual learning. Decentralized learning is the second way. It is a new concept and model of enterprise training and learning in contrast to the traditional centralized training and learning. Learning runs through the process of work simultaneously. The learning space can be the post or not the post, and the individual learning can also form a study groups. Learning island is an effective form of decentralized learning. It is widely used in German manufacturing enterprises which can be briefly introduced like this: analyzing tasks and skills, selecting jobs, setting up learning facilities and goals, and designing tasks for learning islands (Lu, 2011).

2.6 The Construction Model of High Skilled Personnel in China

This section is built to offer a benchmark on the building of highly skilled personnel both in China and internationally. We consider that this is required to inform our model and decisions on recommendations.

2.6.1 The Training Modes of High Skilled Talents in Ancient Times

(1) The guild apprenticeship

As early as the Song Dynasty, the guides were set up and the apprenticeship system came into being. At that time, the working experience as an apprentice is necessary for one to engage in any business and specific rules about how to apprentice, study, live and complete were specifically stipulated by guilds. For example, Shanxi merchants, as a successful

business group in the Ming and Qing Dynasties, adopted guild apprenticeship which may still be used for reference for the training of skilled talents today.

The specific rules adopted by Shanxi merchants are as follows. First, the apprentices should be selected according to strict recommendation system with good family background; second, once the apprentices enrolled in they must be trained strictly. However, before their actual learning the skills of doing business they had to work as trainees for three years, during which time they were require to serve tea and water to the shopkeeper who examined the potential businessmen; thirdly, the apprentices need to be strictly examined when they completed their long term of skills training; fourthly, to attract and retain talent, Shanxi merchants set up laborer shares system in which apprentices share profits of the business he or she worked for according to their skill level. Under this system, apprentices can own skills and share profits.

The guild training mode originated from the ancient times gradually takes its shape and is accepted by people with its practical education method of bringing young student up by old master in a family. It has its own features. On the one hand, it creates objective conditions for its own development because it caters to production needs and the social environment of family organization and social system changes; on the other hand, the teaching mode of learning skills from the older generations of the family has a certain balance between costs and profits so it has long been passed on in the history of our country.

(2) The apprenticeship of the Technology Bureau

In the late Qing Dynasty and the Republic of China, the Technology Bureau was set up to train apprentices in factories in a large scale to reform the traditional training mode of on-site learning. To improve the skills of apprentices in various aspects, the learners are required to study both theoretical and practical knowledge and apply the acquired knowledge into operation in factories. Influenced by the idea of "Chinese Learning as the Fundamental Structure, Western Learning for Practical Use" advocated by feudal government at that time foreign teachers and teaching methods were introduced into China to train apprentices to acquire special skills. The system of trainee and intern was adopted in the teaching mode. At the same time, the teachers' legal rights and obligations can be guaranteed with the form of

signing contract which may also make apprentices served with better education. Meanwhile teaching years were flexible so that students can be assessed and examined at any time. The apprentices' wages and teachers' allowance were also clearly defined in contract. In a sense, it has the nature of the enterprise school teaching pattern in modern times.

Characteristics of talent training mode adopted by official factories are as follows: firstly, the government is both the manager and the owner of talents since it has imperial power to manage talents and gives relevant rewards to them according to their efforts which may guarantee the quality and quantity of talents training; secondly, there's much in the teaching methods that we can use in the training of high skilled talents in modern times such as learn by perception and examples, on-site training and study by high quality teaching staff, the strict production standards and the examination systems; Lastly, the idea of respecting teachers has a good effect on apprenticeship since teachers and students may cooperated closely, which should arouse our reflection and study in modern times.

As analyzed above, ancient Chinese people have their own special training modes with distinctive features at that time which can be learned by us today since handicraft industries and the products achieved tremendous success due to their appropriate talents training.

2.6.2 Modern High Skilled Personnel Training Modes

(1) The skill training mode of work-study

During the Yanan period from 1935 to 1948 Mao Zedong put forward a work-study program in Shanxi, Gansu and Ningxia schools as a way to spread culture and knowledge at that time. It means people work with study combined to achieve great production of food and clothes which are necessary for revolutionary struggle. In a sense, it cannot be recognized as a way of skills training since no systematic teaching modes were organized. However, the concept of work-study program was soon widespread in higher education and vocational schools after the founding of the People's Republic of China in relatively small scale and work-study schools were highly accepted by people (Cao, 2013). Many schools have factories and factories also have schools. To be specific, the system of "Monday to Wednesday" and "Thursday to Saturday" was adopted, that is - three days of work in factory and three days of

study in school. In total three years of work-study program, students take three days of work and three days of study in a week in the first year and four days of training in factory and two days of study in school in a week in the second year while they work as trainees in factory in the third year. When working trainees in a factory the students have salaries as ordinary workers. At the beginning of China's foundation, the training mode of work-study provided a large number of skilled workers for the recovery of economy and improvement of people's livelihood.

Later on, school education gradually replaced the training mode of work-study program and apprentices came out of the factory wholly and entered schools as students learning theoretical knowledge by textbooks and educators.

(2) The training mode of Suzhou Industrial Park or SIP

Founded in 1994, the Suzhou Industrial Park (SIP) is a flagship project set up in Suzhou alongside the Yangtze River Valley by Singapore and China's government to attract foreign manufacturing enterprises. In its early days, the main focus of the park was the electronics industry. In recent years, it has also been involved in other high-tech industries, such as genetic engineering, precision machinery and new materials. SIP has become one of the fastest growing and most competitive development zones in China, with high quality infrastructure and efficient management introduced by Singapore.

However, the shortage of skilled labors in some fields has posed great threats to local industrial development. To solve the practical training problems like imperfect VET (vocational education training), the inappropriate basic training place of workshop and high skilled workers' job-hopping SIPAC (Suzhou industrial Park Administrative Committee) conducted a useful exploration of the reform of outdated training modes (Li & Sheldon, 2010).

As a local government agency SIP, SIPAC has some autonomy in labor related preferential policies. For example, SIPAC has the authority to provide residence permits to employees in private companies which is necessary for SIP enterprises to recruit skilled workers especially senior high workers throughout the country. Besides Human Resources Development Co., Ltd. Of SIP provides various human resources services for the companies

in the park. For example, to alleviate the shortage of skilled talents, HRD improved the cooperation between SIP and VET schools to make the HRM strategies of enterprises better applied into local labor market to achieve the win-win cooperation between the company and the local institutions. It also integrates the different VETs of enterprises, institutions and social groups by combine the formal education in schools with informal education in factories to provide practical skills enterprises needed to students and recruit skilled workers throughout the country. Besides, it initiates a cooperation agreement between the SIP companies to limit job-hopping in the area (Sheldon & Ruan, 2004). To a certain extent, it has solved the problem of skills shortage in the vast foreign investment by the implementation of remedial measures.

(3) "Dual System" of the School-enterprise Cooperation

As a county-level city in Jiangshu under the jurisdiction of Suzhou Taicang has always been a pioneer across the country with its fast-economic growth since the first German enterprise of Kern-Liebers Taicang Kern-Liebers Group entered in 1993. Actually, more than 220 high and new tech enterprises in the world have entered Taicang which has been named as “the hometown of German enterprises”. With the promotion and participation of German enterprises, the dual system of Vocational Education in Germany has been introduced here and formed its own "dual system" with four training modes including the localization of shareholder cooperation, enterprise order, enterprise participation and school participation (Yang, Wang, & Liu, 2017).

The "dual system" of school enterprise cooperation in Taicang has its own way to deal with the skill shortage under the socialist market economy. That is, it builds up its own skill production system regulated by enterprises to provide special skills to relevant fields so it is a skill ecosystem with dual system of school enterprise cooperation.

The so-called "dual system" is the "dual" school enterprise cooperation mode of "government guidance, dual participation, contract execution and cost sharing". The so-called "skill ecosystem" is a collection of high, medium and primary skills created by enterprises, markets and institutional networks in specific areas or industries. The main body of skill production (or the main body of training) is a cooperative network system involving in several

enterprises, vocational schools, industry and enterprise organizations, institutions of higher learning, government and many other participants. The main body of production (or units, companies and organizations) consists of Professional Workers Training Center for German Enterprises in Taicang, AHK- Shanghai, Professional and Technical Workers Training Center of Suzhou Chien-shiung Institute of Technology, Taicang European and American Enterprise Professional Workers Training center, Schaeffler (China) Training Center, Haring Professional Workers Training center and other vocational education and training institutions. In 2015, AHK Sino German “dual system” Model Base for Vocational Education---Schaeffler dual system application-oriented undergraduate program co-organized by Chien-shiung Institute of Technology and Tongji University was signed up. Besides Taicang is also China's largest "German vocational qualification" examination and training base to provide skilled talents for German enterprises.

In the skill ecosystem, different subjects have different positions and participate in different types of interaction (Figure 2-2). Enterprises, cooperative training institutions and vocational qualification certification bodies constitute the production part of the skill ecosystem. The enterprises and cooperative training centers built by enterprises are located in center part. In cooperation, the German enterprises have a dual role: they are both demander and the supplier of the skills. Together with the local vocational school, they have completed the joint training of the skills.

The German Chamber of Commerce plays the role of professional qualifications authentication to ensure the quality of professional skills in the industry.

The local enterprises association plays a key coordinating role in the skill ecosystem to make enterprises compete in an organized order.

Secondary vocational education institution is also an important part of the skill ecosystem. It mainly participates in the training of skilled workers and provides secondary school education.

AHK “dual system” Model Base for Vocational Education belongs to the mixed ownership organization and acts as certification body and intermediary agency. It was created by the joint investment of the Suzhou Chien-Shiung Institute of Technology and the German

industry and Commerce Association. The base is mainly responsible for the promotion of the dual system of vocational education, teachers training, on-duty-employee training, German vocational education certification, International Vocational Education Exchange and so on while Tongji University is skills provider at higher level in this skill ecosystem to provide application-oriented bachelor's degree.

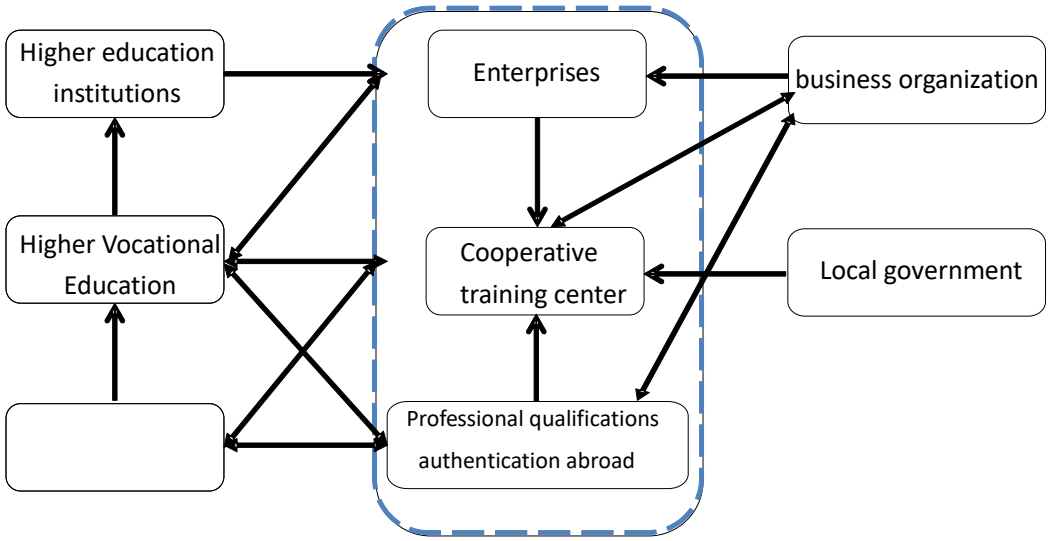


Figure 2-2 Taicang skill ecosystem

Source: Yang, Wang, and Liu (2017)

Local governments are an integral part of the skills ecosystem. It provides a platform for the survival of the ecosystem - the Sino-German small and medium enterprises demonstration plot so that the schools and enterprises can be better cooperated. A series of preferential policies have been issued such as the "Suzhou City vocational education school enterprise cooperation promotion method", "further deepening the implementation of the city's cooperation with Germany" to make the "dual system" education better applied.

Unlike the experience of Zhongshan city in Guangdong Province, the leading role played by Taicang in skills training is not local governments, but the German funded enterprises. According to the production needs, these enterprises transplant the "dual system model" to China and integrate it into the local vocational and technical colleges and universities to form a new one. Thus, a technological production ecosystem centered on German enterprises has been formed in Taicang. From the point of view of system matching, the focus of the Taicang

mode is to change the enterprise governance mechanism - the "complete free competition" between the enterprises of the same industry in a particular region is changed into "organized competition" through enterprise coordination. This change has improved the complementarity between the corporate governance mode and the skill production system, thus enhancing the enthusiasm of enterprises and employees for skill investment.

(4) Training mode of high skilled talents in school enterprise community

The school enterprise community mode is one of many new modes created in some provinces and cities in China since the reform and opening up 40 years ago. Many communities have been set up such as the Fair Friend Mode promoted by Fair Friend Institute of Electromech, the Zijin Mode of Zijin Mining College set up Fuzhou University and Zijin Mining Group, the international maritime training center of Nantong Vocational & Technical Shipping College, China Railway 13th Bureau Technician College and Suzhou Tourism and Finance Institute. They all have common goals of cultural integration, win-win cooperation, resources and risks sharing, etc.

The school enterprise community mode can be defined as follows, “According to the forming mechanism of professional ability of high skilled talents, the traditional concept of vocational education should be transformed to the idea of Higher Vocational Education based on the formation of human capital. The school enterprise community mode of modern higher vocational education has the characteristics of practicality, skill and employment orientation. It complies with formation rules of professional skills and vocational technology, professional attitude and the formation rules of high skilled human capital (Ma & Guo, 2008). It attaches importance to the integration of school and enterprise cultures. It has "cross-border" nature which involves many boundaries, such as the school and enterprise, different developing concepts, work and study, the growth of professional ability and the cognition of vocational education.

The characteristics of the model of the school enterprise community are as follows. First, the integration of the training subjects. The mode of school enterprise community is an integrated operation system with a certain structure and level. It is organized by the subjects at all levels mainly including higher vocational colleges and enterprises. Second, the

completeness of organizational structure. The school enterprise community has a complete organizational structure, that is, the policy of the main node, the higher vocational colleges and the enterprises, form the network organization structure, the management system, the implementation system and the cooperative system. Third, systematic skills training. The operation system of the school enterprise community mode includes the dynamic basis, the guarantee conditions, the teaching system and training evaluation mechanism.

The advantages of the mode of the school enterprise community. First, the cost of running is saved; secondly, the speed and frequency of information communication of the main body are enhanced; third, the flexibility and effectiveness of each main body in the school enterprise community are strengthened.

Overall, in a study conducted both in India and China intended to understand commonalities and specificities of talent management HRM practices, Cooke et al. (2014) depicted Chinese practices which we partially reproduced in Table 2- 1, specifically targeting the macro level management (dependent on public policy).

A specific set of practices conducive of talent attraction, development and retention can be seem in China, due to its socio-economic context. It is the housing difficulties and social security needs together with national and provincial awards that is more singular. Also, due to the fast-economic growth supported on the old “made in China” model (competitive on pricing basis), working conditions play a central role.

Also, the same study identifies three types of barriers to effective talent management: individual, organizational, and macro level. Individual barriers include counterproductive attitudes and behaviors such as unwillingness to invest in long term relation with the employer and instead wanting to increase short term return by moving around, excessive bargaining power from employees with rare skills. It also includes a competence problem when key employees that are identified as talents do not match expectations. At the organizational level, Cooke et al. (2014) identified three issues, leadership issues (indifference to talent management due to lack of personal incentives, excessive demand on excellent workers or nepotism), poor strategic HRM (lack of growth opportunities for young talents, personnel seen as a cost instead of an investment), and HR competence issues (ineffective

incentive systems, poaching instead of cultivating talent internally, recruitment flaws). At the macro level the authors identified two barriers pertaining China: the education system (higher education and training institutes develop misaligned skills due to lack of resources, outdated materials and low training standards) and the HR development planning issues (lack of systematically planning HR development in industry, lack of specialist talent).

Table 2-1 Talent management practices in China

HRM practices	Examples
Financial incentives	• A bespoke wage policy that is separated from the mainstream wage policy to attract talent • Housing benefits and start-up fund to attract talent • Voluntary benefits for employees' future concern (social insurance, company pensions)
Training and development	• Sponsoring qualification-based higher/further education • In-house training and learning programs
Performance management	• Linking skill/competence contests and awards
Improving working conditions	• Improve working environment to raise employees' satisfaction level.

Source: Cooke et al. (2014)

So, in the case of China, we built a set of propositions that guide two models: the first model, explanative in nature, is intended to help understanding the situation, and a second model, causal in nature, is intended to map the causes.

2.7 Towards a Descriptive Model of Talent Management in Zhongshan

A descriptive model should include, in a structured and systematic way, all the dimensions that allow a comprehensive and logical depiction of the situation. By thinking about all the information we believe there are two dimensions that are helpful in building an integrative model. These are the "stakeholders" and the "HR strategic functions".

2.7.1 Modern High Skilled Personnel Training Modes

(1) The first dimension: Stakeholders

This dimension concerns stakeholders at the individual level (highly skilled workers); organizational level (training institutions and enterprises); and macro level (governmental policies, and the society). The system is made of all the interactions between these stakeholders according with their interests.

Individuals are interested in complying with societal and economic needs for a useful workforce. For that purpose, individuals will look for education to acquire and develop competencies needed for the economy and society. Training institutions are interested in attracting individuals to become students and providing competence-based education that can build their reputation of useful organizations for society and economy. Enterprises are interested in finding in the job market qualified individuals that match their working needs without much more training investment. The whole success of this system depends on individuals being interested in learning, on training institutions being capable of effectively training such individuals into relevant competencies and enterprises being capable of giving optimal conditions so that all the potential of individuals (now seen as qualified workers) be transformed into real productivity. Aligning all these stakeholders is not something that occurs autonomously. Therefore, governmental agencies are interested in creating conditions to increase alignment between these stakeholders while ensuring such alignment adds value and fit in society expectations of prosperous and harmonious life.

(2) The second dimension: HR strategic functions

The second dimension concerns the function of talent management following the structure of AMO strategic HR model (Lepak et al., 2006). This model aggregates all strategic functions of HRM into three components: Ability, Motivation, and Opportunity.

In the original proposal ability translates into practices such as skill enhancement, training, or performance appraisal. Training is an activity destined to target personal and professional needs and providing the necessary stimuli to guarantee learning (that is, the change of knowledge, beliefs, behavior, attitudes and values, according with the professional

requirements for good practice). Skills enhancement can be less obvious because it targets the development of competencies by providing experiences (for example, job rotation) that push the individual into a need-to-cope environment and learning by doing. Performance appraisal is the necessary step to provide workers with a honest and useful feedback of how they are performing contrasted with expectations. Without such feedback the workers themselves cannot understand if they need to correct anything, and the managers and employers do not know what can be improved. The correct application of these practices allows optimal ability development.

Motivation concerns all practices that enact the workers' will to effort into achieving objectives and overcoming all obstacles at work. These practices vary by are united by their focus on reinforcement systems such as incentive plans and also designing work in such a way that it fits individuals' needs. These comprehend protecting their health, building a sense of achievement, or challenging their capacity.

Opportunity concerns workers empowerment via participation in decision making giving individuals a sign that they are trusted to contribute to decisions and share risks. Simultaneously, participated decisions always count on participants' commitment and thus are intrinsically supported by all.

Crossing these dimensions produces a table that allows us to detail (in cells) each stakeholder role (aggregated by level of analysis, individual, organizational and governmental) in answering the ability-motivation-opportunity needs to build a talent management system (Table 2-2)

2.8 The Construction Model of High Skilled Personnel Internationally

Vocational training has been attracting the attention of both scholars and governmental entities concerned with the bridge between education, work and economy. Governments understand the importance of occupational training and so put effort in learning from best cases and innovate so to provide the best possible vocational training system that contributes to the wealth and well-being of society. Although no single country can objectively claim to

have built the best system, some groups of countries have been studied due to special features in providing society with a competent skilled workforce. Amongst these Hoffman (2011) selected Australia, Austria, Germany, The Netherlands, Norway and Switzerland while Mulder (2017) included chapters targeting the USA, UK, Germany, France, Estonia and Lithuania, Italy, China, Vietnam and Rwanda. At the macro level, Vaiman et al. (2018) focused on the cases of USA, Canada, UK, Germany, Spain, Denmark, Finland, The Netherlands, and Australia. Considering extant literature as well as the focused nature of this thesis in China (Zhongshan, to be more precise) we opted to review vocational education features of Germany, UK, USA; Canada, Australia, South Korea and Japan, namely we focus on the guiding principles these countries set up.

2.8.1 Guiding Principles for Training High Skilled Talents in Foreign Countries

Through a comprehensive comparison and analysis of the practice of training high skilled personnel in some national colleges, such as Germany, the United Kingdom, the United States, Canada, Australia, South Korea and Japan, it is found that the developed countries have the following clear guiding principles in the training of highly skilled personnel.

(1) Focusing on the training of practical, comprehensive and key abilities

Aiming at the training of practical abilities is a notable feature of Vocational Education in developed countries. The training goal of Higher Vocational Education in Germany is to make students become professional and technical talents who can engage in professional activities independently in a certain field by carrying out necessary basic theory education and full vocational training.

The United States, Germany, Japan and other countries cultivate students' technical application and practical abilities as the center of teaching. In Germany a professional trainee is required to be familiar with 7-8 types of work, while in Korea skilled talents are developed by the process of transformation from single skill’s training to multi-skills grasping.

In this new century, the international community put forward the concept of training "key capabilities" and "technical humanists". At the second International Conference on

technical and vocational education, many representatives believed that entrepreneurial ability, communication skills, cooperation, self-regulation, analysis and solution, creativity and sense of responsibility were the "key capabilities" of the new century. The goal of training should be changed from pure technical laborers to "technical humanists".

Table 2-2 Descriptive model

	Ability	Motivation	Opportunity
Individual	As students, individuals must have the fundamental knowledge and attitudes to be able to learn. As workers, individuals must be able to cope with continuous learning.	As students, individuals must have the will and attitude favorable to learning. As workers, individuals must we willing to accept continuous learning and embrace change as a necessary condition of life.	As students, individuals must be willing to take the opportunity to learn by experience as positive for their life. As workers, individuals must be willing to be proactive and participate in job decisions.
Organizational – education institution	Qualify students	Attract students and motivate to transfer knowledge	Give students capacity to perform without supervision
Organizational – enterprises	Offer work experience that challenges current skills and push their level up.	Rewards skills and performance according with each worker's performance and potential.	Bring workers into decisions to guarantee their commitment
Governmental	Create policies that support training, that guarantee training quality and relevance both in education institutions and within enterprises.	Create policies that counter exploitation practices, to ensure organizations value and reward in a fair manner worker's skills and contribution to the performance of the productive system. In this way citizens confirm that investing on education and continuous learning always gives worthy compensation.	Create policies that foster a participated decision making in enterprises and building a culture of individual proactive responsibility for the well-being and performance of everybody.

(2) Market oriented specialties to meet social needs.

In Australia specialties are designed to meet the needs of society and market. Specialties are designed specifically for a certain post or post group. For some interdisciplinary posts, comprehensive courses and specialties are designed to realize the communication and integration of related subjects and even different disciplines.

The talents trained by higher vocational education in Germany are mainly employed in the local area and the designs of specialties fully reflect the local needs so the skills the talents learnt are applicable in accordance with the needs of social and economic development. Therefore, graduates from German schools have strong competitiveness in the job markets which can be shown by a trend that the employment rate of German graduates is higher than that of ordinary university graduates.

Based on this we infer the proposition for guiding principles #1: Highly skilled talents education must consider skill relevance.

(3) Practical curriculum to meet the needs of different industries

In 1990s, the Australian government stipulated that training standards and contents should be designed to meet the needs of relevant industries. The concept of Industry Training Package including three aspects of competency standards, qualification certificates, assessment guides was put forward then. "Industry training package" closely links the requirements for practitioners of various jobs with the educational and training objectives and the national vocational qualifications to meet the needs of the various industries and the standards of the teaching.

Another case is Canada's curriculum which features the unique DACUM program that closely combines the demand for talent market with education and teaching. The choice of courses depends entirely on the wishes of the industry and employers. As a result, the developed courses are not only accepted by students but also welcomed by enterprises since the skills can be put into practice accordingly.

Based on this we infer the proposition for guiding principles #2: To guarantee job market relevance of skills training / education, the authorities empower enterprises to define which courses should be offered.

(4) Flexible and individualized training mode to emphasize the collaboration between industry and school

Germany's "dual system" mode embodies the characteristics of competency-based learning. Its purpose is to cultivate students' ability to adapt to competition and development.

All kinds of secondary school graduates must first apply for an apprenticeship to a certain enterprise or institution if they want to find a job. The vocational schools and enterprises jointly carry out training for them, and schools carry out theoretical teaching according to the general teaching plan of each state. This kind of training mode takes the industry as a priority so that talents trained according to the needs of relevant industries. For example, in Mercedes training center technicians are required to learn the theoretical knowledge one and half day in vocational school and then to be trained in the training center of the factory for another three and half days.

Based on this we infer the proposition for guiding principles #3: competency-based learning should occur in mix school-enterprise learning places with both a theory and practical focus.

(5) A scientific and standard examination system and effective operation mechanism.

It is necessary to implement a complete system of national professional qualification and skill identification, and to strengthen the connection between the general education curriculum and the vocational education curriculum, and to establish the communication between the academic qualification and the general qualification, to ensure the high quality of the talent training.

By enacting the following laws including the Regulations on Vocational training, the Law of Vocational Education, the Handicraft Industry Ordinance and the Standard Examination Regulations, etc. in Germany, the minimum standard for each professional examination is stipulated and the examination is carried out strictly in accordance with the laws and regulations which to a certain extent ensure the high quality of the dual system training

Based on this we infer the proposition for guiding principles #4: Government should set national standards for vocational training, and examination to ensure the high quality of training.

Since 1990s, the UK has carried out far-reaching reforms in the field of vocational education, including the implementation of the national vocational qualification (NVQs), the general state professional qualification (GNVQs), and the new model of vocational education

and training. The obvious characteristics are as follows: focusing on the assessment of practical ability; opening the qualification assessment; replacing the summative assessment with regular assessment; and recognizing the past learning achievements. This can not only avoid unnecessary duplication of training content, reduce the waste of educational resources, but also make the training process more able to meet the actual needs of each trainee.

It is worth mentioning that Singapore's talent strategy should attract our due attention. The talent strategy of Singapore has the following five important features (Wang & Liu, 2015): First, it is directly promoted by the supreme leadership of the government as a national strategy; secondly, it attaches importance to the training of local talents to improve the overall quality of the population; thirdly, it introduces foreign talents strategically according to the economic development of different periods; fourthly, it adheres to the principle of combining government guidance and market in the process of the implementation of talents; and fifth, it establishes relevant policy supporting mechanism to effectively identify, manage and cultivate talents which is of great reference value to China when it is facing the problems of the population aging and transformation of economic structure.

Based on this we infer the proposition for guiding principles #5: Government should establish supporting mechanisms to identify, management and cultivate talents

2.8.2 Several Training Modes of High Skilled Talents in Foreign Countries

(1) "dual system" in Germany

The so-called "dual system" is generally embodied in the following aspects: the dual participation of enterprises and vocational schools, the dual regulatory body of the federal government and the industry association, the dual teachers of the enterprise trainers and vocational school teachers, the dual curriculum of theory and practice, the dual identities of students and apprentices, and the dual funds from enterprises and the government, the dual examination of the intermediate and graduation examination and so on. The training goal of combining two into one and the implementation process of dividing one into two have strong dual characteristics. As the "secret weapon" of the German economic takeoff, the dual system has a complete education, legal and educational responsibility systems. The three systems

promote and ensure the basic coordination and balance of the interests of the participants in the dual system through the invisible guidance or physical coercion force. In the article "*human resources in twenty-first Century*", Robert stressed that the rapid development of manufacturing and emerging industries must rely on the important role of high-quality skilled personnel which play a supporting role in the economic development. Therefore, the German government has invested a lot of funds to develop vocational education which has a significant and profound impact on the cultivation of high-quality skilled talents in Germany.

The dual system in education is shown as follows. The students may have three educational choices during the whole educational process. After the end of primary education, 20% students choose Kaethe-Kollwitz-Schule Kiel (integrated school to learn theoretical knowledge), 30% choose Realschule (school to learn practical and theoretical knowledge), 50% choose Gesamtschule (to learn comprehensive knowledge), thus the proportion of vocational and general education is about 3:7. The vocational high schools mainly include the part-time schools and the apprenticeship schools, the full-time vocational schools, junior high schools, vocational or technical high schools and specialized vocational school. After secondary education, they may have the third choices in the higher education stage in which about 30% of students choose the further higher education while 70% go to direct employment.

Based on this we infer the proposition for training #6: Stakeholders from education and industry should be both implied and invest in building a learning program suitable for society needs. Likewise, we infer the proposition for training #7: The government states the mandatory professional competency-based learning for all students to guarantee society understands its value for economy.

The second significant characteristic of the German education system is to set up a conversion platform for students to transform from general education to vocational education or vice versa. Although only 30% of the people entering the higher education within the third stage of choice to seek for five years of study in comprehensive universities a relatively small number of students from full-time vocational schools can still apply for the further education

in universities. Under the guidance of employment, the "dual system" vocational high school has the function of "Overpass".

This kind of vocational education system in Germany has two benefits for students. First it is fair for students to make free choices between general education and vocational education since the vocational system is an overpass for different types of teaching modes. Second there are no obvious wage gaps between "white collar" and "blue collar" in Germany.

Based on this we infer the proposition for training #8: Students should be allowed to transfer easily between general education and vocational education systems. Also, we infer the proposition for training #9: Salaries should not undervalue the importance of skilled workers

The successful operation of German dual system not only depends on a complete legal system, but also a perfect executive responsibility main body. It involves the participation of the federal government, industry associations, enterprises and vocational schools (Wang, 2010).

Specifically, the responsibilities of the federal government are concentrated on the formulation of relevant laws and regulations, the funding of education funds and the supervision of training institutions.

The trade associations are responsible for the operation of the dual system in their own fields. Its funding mainly comes from the fee of the enterprise, the charge of the qualification examination, and the income of the consulting service. As an association to maintain the reputation of the industry, the business association is its only legal organization, which serves as a bridge between the government and the enterprise. The federal government often realizes the indirect supervision and management of the enterprise through the business association. Its specific responsibilities are to formulate regulations, contracts and test regulations in the industry; to provide advisory services, review training places, contracts and qualifications of training partners; to supervise the implementation of training plans and to organize training examinations, etc.

The enterprise is the main body of the dual system of school enterprise cooperation since it provides training places, enrolls apprentices and pays the cost for the training process. The

enterprise is also the main teaching owner dominating most time of the educated and is responsible for training, selection and quality of training teachers; Besides graduation examination is held in the enterprise and the employers accounts for more than 2/3 of the members of the examination committee of the industry association, and the training certificates are issued by the training enterprise for their great career future.

Vocational schools are the largest number among various types of schools in Germany. After the approval and appraisal, the applicants are required to find the vocational schools in accordance with their own special skills learnt in the training enterprises. The vocational schools should provide theoretical teaching to students according to the "framework education program" unified by the Ministry of Culture and Education. The vocational schools should accept the regular supervision of the Industrial and Commercial Association. In general, each subject of responsibility is responsible in its own authority which forms a complete system of responsibility to ensure the successful operation of the dual system vocational training (Figure 2-3).

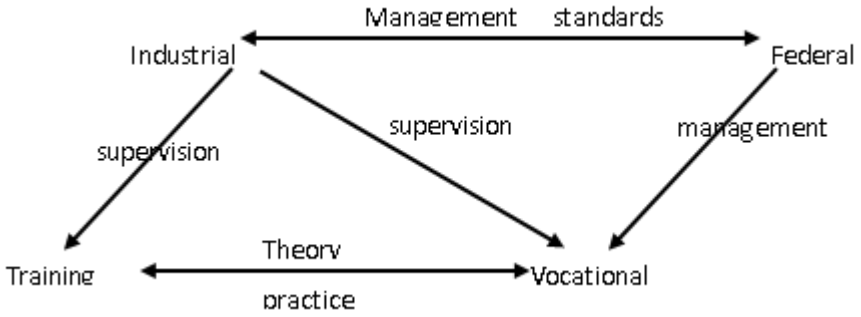


Figure 2-3 Dual system of vocational education in Germany

(2) The training mode of TAFE (Technical And Further Education) in Australia

Australia adopts the training mode under the government standard, which is mainly embodied in the government's "purchase" training. TAFE is the core of Australian Vocational Education and training. It is not only the mainstay of the Australian life-long education system, but also an important carrier for the government to carry out political and economic policies.

TAFE has gradually formed a set of effective system framework for the training mechanism of high skilled talents in the long practice of training skilled personnel. The active

participation of the government and the industry, the unique qualification framework system, the scientific process of the training package and the perfect legal system jointly guarantee the training and supply of high skilled personnel in Australia.

The Australian National Training Framework System (ANTF) under the TAFE model is the core of its vocational education and training, including the three classic frameworks of the Australian quality training framework (AQTF), the Australian qualification framework (AQF) and the training package (TP). Based on the AQTF standards in accordance with AQF Australian Vocational Colleges and enterprises realize the training of highly skilled talents under the cooperation between schools and enterprises through the development of training packages.

The Australian qualification framework (AQF) links vocational education with professional qualifications and pays more attention to the continuity and cohesion of academic degrees at all levels and realizes the mutual transformation and recognition of different educational levels, thus opening up the channel of life-long education in Australia. Specifically, after six years of primary school education, students can choose to complete the vocational education courses while study comprehensive courses during the two years of high school education to obtain VETI and VETII. After high school graduation, the students can choose to enter the general school to study the bachelor's degree or to enter the TAFE to obtain vocational education and training. The proportion of the two choices is about 3:7, and the students who have completed the certificate I and the certificate II can also enter the TAFE to obtain diplomas or to get higher qualifications and certificates at this stage for further higher education. A diploma or higher diploma in TAFE can also exempt certain credits and is recognized by the general higher education.

Based on this we infer the proposition for training #10: Professional education should be taken as life-long learning

In fact, about 80% of the students who choose higher education will return to the TAFE to get vocational qualifications again because Australia government stipulates that any workers in industry must have a qualification certificate under AQF and the higher level of certificates are generally associated with better job and high salary.

There is a competency-based training package system in Australia. Actually it attaches great importance to the development and reform of vocational education system, and has launched a competency based training system and a unified national qualification framework. National qualifications are designed to raise the level of Vocational Education in the training of highly skilled personnel. They are characterized by the formation of training modes of the common education, vocational education, the system of trainees interactive with each other in various forms under the national unified qualification system. This training mode takes the leading distinctive special "skill" as the evaluation standard of talents. (Department of Education and Training, 2017)

(3) The training mode of vocational ability in Britain

Clark, a British scholar, believes that if workers have only been trained in task dependence skills, they have difficulty in learning new skills, but if workers are trained through integrated skills they know how to plan and regulate their own work to understand the drawings and self-management better. So even without supervision from others, they can work independently and accomplish tasks with high quality. On the basis of the traditional apprenticeship and continuing education system, the "sandwich" cooperative teaching and "modern apprenticeship" are designed guided by the National Vocational Qualifications (NVQs).

First, the national vocational qualification system (NVQs) determines the structure of vocational ability and forms the national standardization for capacity-building. It has led the quality view of higher vocational education and laid a solid foundation for vocational ability training. Second, the "sandwich" cooperative teaching mode is the basic mode of vocational ability training in Britain, that is, the combination of school and enterprise education. The implementation of the talent training means that after the students graduated from high school, they first worked in the enterprise for 1 years, then returned to the school to complete two to three years of relevant theoretical study, and then to the enterprise practice for 1 years, that is, the so-called "1+2+1" or "1+3+1" education mode, and was visualized as "sandwich" model (Guan, 2003) Third, "modern apprenticeship" is the key mode of vocational ability training in the UK ."The modern apprenticeship" is a typical representative of the school enterprise

cooperative education. In the UK, there are nearly a hundred industrial and commercial fields working with colleges and universities to carry out the long-term apprenticeship education and training, especially in the emerging industries, such as medical health, information technology, tourism service and electronic commerce. The "modern apprenticeship" mode and the Competence-Based Education (CBE) mode are same with each other in essence since they all pay great attention to the cooperation between the higher vocational colleges and the industrial and commercial enterprises. For example, the school enterprise cooperation education of Mohawk College is very typical in the North American. Vocational colleges and universities in Canada have formed a long-term strategic cooperative relationship with many world-famous enterprises such as BCE Bell Canada Enterprises, International Telephone and Telegraph Corporation, Ford Motor Company, Toyota Motor Corporation which makes the vocational ability training in Canada at the international front level (Yang, 2010)

Based on this we infer the proposition for training #11: skills training should go beyond task skills so that workers become more autonomous and self-managed.

(4) the mode of "production and learning cooperation" in Japan

The training forms of "production and learning cooperation" in Japan mainly include the following: First, industrial enterprises invest funds into schools to buy facilities, equipment and manage better while enterprises may participate in the training of students, the establishment of curriculum and assessment standards according to their actual needs. Second, the enterprise and the school need to strengthen their mutual communication and cooperation. For example students can go to the enterprise to participate in the field practice while the enterprise staff can go to the school to seek further study, so that they can learn from each other to promote their own abilities. The enterprise can also entrust the school to carry out scientific research according to the production needs. The research results can be transformed and put into actual production to speed up the technological innovation of the enterprise. Not only the enterprise can profit from the enterprise, but the relevant cooperative schools can also get a certain reward. The method of "production and learning cooperation" has not only effectively realized the innovation of science and technology, improved the production

process and promoted the development of enterprises, but also improved the quality of skilled talents of the whole industry (Shi Weiping, 2001).

Third, the mode pays attention to the subjective initiative and autonomy consciousness of employees. Enterprises regularly organize skills training to improve the professional ability of laborers. The workers combine the newly learnt knowledge and skills with the quality monitoring of the production process and the maintenance of the production facilities, and constantly improve the technology and skills of their own. Enterprises attach importance to the information communication of the work team so as to improve production efficiency.

Fourth, it adheres to the humanistic concept of enterprise production management and constructs flat production organization structure. It is not enough for the modern production of enterprises to rely solely on technological innovation. The highly skilled personnel and the way of production organization of enterprises play a huge role. The leading high-tech, efficient labor organization structure and high skilled personnel cooperation jointly develop and construct a new and efficient modern enterprise production mode, forming a mutually restrictive cooperative development relationship between technology, organization and talents. The new and efficient modern enterprise production mode includes three aspects of human, technology and system. To be more specific, the high skilled personnel, technology with equipment as the carrier, and labor organization that plays coordinative guarantee the sustainable development of the enterprises (Figure 2-4).

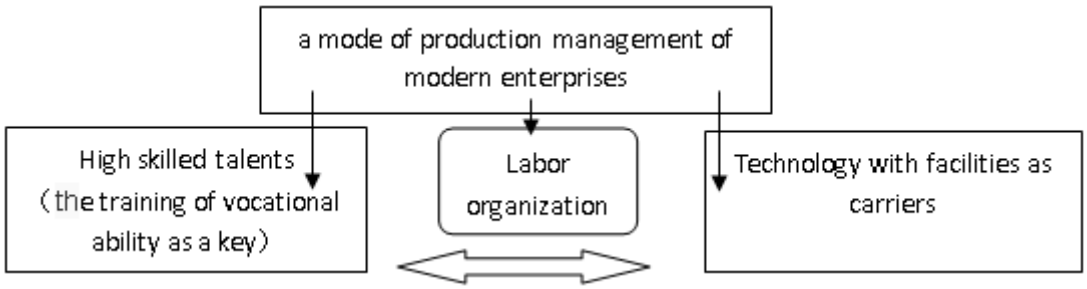


Figure 2-4 A mode of production management of modern enterprises

The new mode of production management of modern enterprises has changed the working mode, content and equipment of highly skilled personnel, and it also requires skilled talents to change their post orientation. Specifically, skilled personnel need to adapt to three changes respectively. First, they need to adapt to the change of work way. That is, the work

way has changed from the highly differentiated detail post task to the integrated task collaboration group so high skilled personnel need to grasp complex skills of the industry and have the ability to self-oriented study and communication with co-workers to acquire the new professional technology in the collaborative work in time. The ability to acquire; secondly, they also need to adapt to the change in the content of work. That is, the content of work has changed from a single simple technology by hands into the creative work by both hands and brain, which requires the high skilled personnel to have the rational thinking ability to analyze and solve problems; thirdly, they need to adapt to the changes in the equipment of the workplace. That is, the equipment has changed from high efficiency special equipment in mass production line to flexible production equipment to produce a series of single products which requires high skilled personnel to have the ability to flexibly control the high degree integrative equipment to create more efficient production value.

Based on this we infer the proposition for training #12: highly skilled personnel should be ready to cope with change, be flexible and be able to learn autonomously.

The high skilled personnel need to have the professional ability to cope with the career development to actively face the phenomenon of the individual's boundaryless career, and become active molecules that are not affected by the vertical division of labor. The modern enterprise production organization mode puts forward specific requirements for the professional development of high skilled talents. First, the changes in the management system of the enterprise personnel or the change from a strict hierarchy system from decisions at higher level to execution at lower level to a group cooperation system to complete a task together, which requires the high skilled personnel to have the various abilities of organizational management decision-making, interprofessional work, social interaction and cooperation. Second, it is the change of the quality control mode of the enterprise. The change from the final test of the product defect to the test of product quality in the production process requires the high skilled personnel to have the professional spirit of high quality consciousness, production safety consciousness and good faith consciousness. Lastly, it is the change in the innovation mode of technical skills. The transformation of the responsibility from the planning department to the first line production department requires the high skilled

personnel to have the abilities of information acquisition, processing, analysis, self-study ability and creativity.

(5) Cooperative education pattern (CEP) in the Community College in America

In America's monorail educational mode, vocational education is included in general education in secondary schools as one part, then it is conducted mainly by community colleges. It originated between the late nineteenth century and early twentieth century as a primary college to provide senior undergraduates to colleges as its major goal of school education. After nearly a hundred years of development, it has gradually developed into a community college with many functions such as vocational and technical education, transfer education, continuing education, adult education and so on. As an important part of the American higher education system, the community college, based on elite education, has become a model for fair and universal education, and is an important institution for cultivating high skilled personnel in the United States (Liu & Hong, 2010).

Community College, as one part of higher education, provides preparatory courses for two academic years to prepare students for the future college education. Students in the Community College who have completed the preparatory courses have the opportunity to enter the general university so it also has set up a bridge between secondary and university education. It provides an opportunity for students who fail to enter the university before to go after further education again. This is the embodiment of the "transfer function" of the Community College. On the other hand, the students who complete the two year education in the community college can also enter the ranks of the work and obtain an associate degree. In this process, the Community College will give full play to the function of its vocational education, improve the students' professional skills through cooperative education, and find a solid foundation for the smooth entry of the ranks of the work.

Community College, as the core subject of Vocational Education in the United States, has its own characteristics: first, the aim of the community college is to serve the community in all teaching programs. The students mainly include the graduated students, the people on the job, family women, and the unemployed who have failed to enter the four year university. Second, Compared with four years of university education Community College make the cost

of the college education low because the students usually local people close to the college; thirdly, the curriculum and courses are practical and professional since standards of enterprises are penetrated into the whole teaching process; fourthly, in view of students coming from different walks of life at different age, the teaching mode, specialties setup and teaching methods are diversified and flexible. Owing to the low entrance threshold, low cost and strong practicality, the community college embodies the educational equity, and is widely favored by the society so many local people choose to study in Community College.

As for the Community College, there are many benefits. First, its function of vocational education determines the necessity of work-integrated learning as one new mode of education development. Second, cooperative education may improve the hardware and software facilities of the Community College; Third, cooperative education enables the college to test the quality of its "product" through the market to improve the college's teaching methods, quality and reputation.

As for the students, there are also many good practical effects. First, the cooperative education provides a channel for students to obtain the chance to seek for further higher education. Second, it also enhances the effectiveness of its theoretical study. Third, it can also improve its professional skills, reduce the burden of tuition, and increase future employment opportunities

Based on this we infer the proposition for training #13: Vocational and professional education can benefit from a strong community base nature as it can target also population in need.

All in all, the international benchmark based on the depiction of high skilled personnel (or talent management at the macro level) systems is mostly focused on the construction of talent. Basically, we can extract a set of six overarching propositions destined to make a successful talent construction system, as follows:

- Building skills is not enough, they must match society needs i.e. they must be relevant. (principle of relevancy)
- Skill relevance is assured by a co-construction of teaching options joining enterprises and education institutions. (principle of participation).

• Skill education must aim to high quality which is achieved by means of national standardization. (principle of quality).

• Talent potential does not exist only in educated workers and should be recognized both concerning those without certificates as well as fairly rewarded). principle of recognition)

• Vocational education should be valued by society (Principle of priority)

• Talented workers should be empowered to learn autonomously and across life span (principle of self-development)

Although all these principles make sense and converge to build a successful talent construction system they mostly correspond to Lepak, Liao, Chung, and Harden (2006) dimension of "Ability" (both understood as building within society or attracting foreign talented workforce). However, much is to be further designed about "motivation" (other than just fair salary) as well as about "retention". We trust the international benchmark is mainly build on an assumption by some national systems that building is the key priority. However, the dimension of the Chinese labor market, its features concerning workers geographical mobility and strong competitiveness, puts heavy pressure on the issue of retention, as shortage of high skilled labor force is felt in many places in China and can truly create a barrier to full potential for economic development. Likewise, motivation linked to salary is also an issue when one takes into consideration that in a previous phase, Chinese economy grew on top of a high productive efficiency paradigm, with consequently a light payload for enterprises.

Hence, by crossing principles from international benchmark with those from the analysis of Chinese context (from the AMO model plus the stakeholders point of view), allow us to establish a set of propositions. These have two natures, the first couple concern the analysis of the policy of talents (the true need for it and its impact in Zhongshan), while the remaining four concern the further advancement of the effectiveness. The propositions are the following:

• Principle of urgency: Facing the current skilled workers needs and assuming the stability of economic grow in the Delta Pearl River Region, the current capacity to provide highly skilled personnel to enterprises is already insufficient which means the policy on talents was timely. This principle matches the dimension "Ability".

• Principle of policy effectiveness: The national policy on talent construction is successful and a) translated into a growing percentage of highly skilled personnel at least to the target level of 27% forecasted in 2015, b) translated into the larger proportion of highly skilled personnel being young workers, c) translated into an equivalent percentage of male and female workers among highly skilled working population, and d) due to the investment in the vocational institutions the growth in the number of highly skilled population occurred mostly at the undergraduate level. This principle matches the dimension "Ability".

• Principle of priority: Vocational training is a core player in developing a highly skilled workforce but may be undervalued due to the traditional Chinese emphasis on high education. This principle matches the dimension "Ability".

• Principle of participation / co-construction: Enterprises are an important player and positively react to official need to invest in skill construction in Zhongshan. This principle matches the dimension "ability" and incorporates the previous principle of relevancy because the involvement of enterprises ensures it.

• Principle of recognition: Highly skilled workers value enterprises with an organizational culture of well-being and incentives to recognize their positive contribute to enterprises competitiveness although some enterprises still linger on the low-cost high productive paradigm which makes their salaries not attractive. Additionally, the traditional cultural bias towards preferential status of high education compared with vocational education contributes negatively to recognition. This principle matches the dimensions "motivation" and "retention/opportunity".

• Principle of facilitation: Public policies to anchor highly skilled personnel in Zhongshan (namely by easing household registration, children school registration, subsidies to winners of skill awards, and citizenization of migrant qualified workers) are positive to attract and anchor highly skilled personnel. This principle matches the dimensions "attraction" and "retention/opportunity".

Overall, the principles inferred comprehend all AMO dimensions with a predominance of Ability. In the case of these set of integrated principles targeting Chinese context in

Zhongshan, both motivation and recognition are previewed which adds to those extracted from international benchmarking.

We believe these principles can be used to analyze the current situation and according with results and the saliency of each principle, recommend a policy established at the macro Human Resource Management level that maximizes the growth, mobilization, and retention of highly skilled personnel in Zhongshan. Additionally, these principles are transversal to all stakeholders although some fall more under the responsibility of some (e.g. the principle of facilitation is clearly more the responsibility of the government than any other, but enterprises can also play a role in putting into practice that principle).

With this set of principles, we find it useful to develop an empirical study that allows a deep understanding of the current situation concerning variables connoted with the principles. To achieve this deep understanding, we opted to firstly conduct a qualitative phase followed by a questionnaire targeting both individuals and organizations. Our intention was to cover all stakeholders as well as all principles in either qualitative or quantitative approach as we shall explain in the following chapter.

Chapter 3: Methods

This chapter intends to show in detail all the methodological options made pertaining the empirical study. Namely it will explain the research design, the data analysis strategy, the data collection techniques used (interviews, observation in field visits, and questionnaires), its corresponding samples, procedures etc.

3.1 Research Design

As the study is conducted also under the aegis of an official authority, we followed the recommended design which consists of a mixed method approach. Hence, it starts with an inductive phase followed by a deductive phase.

Mixed methods have been gaining popularity as an option to design research because it combines the strengths of both qualitative and quantitative approaches (Bainbridge & Lee, 2014)

According to Saunders, Lewis, and Thornhill (2012) studies can adopt one (or more) of three approaches: exploratory (studies that are intended to gain understanding of any phenomenon by means of insight), descriptive (studies that put together insights from exploratory research into a structured depiction of the phenomenon) and explanatory (studies that structure explanative mechanisms leading to certain aspects of the phenomenon and that have predictive ability regarding such aspects). All these pertain mostly empirical research and target both qualitative and quantitative methods. The present study is at its basis of an exploratory nature but then evolves into a descriptive study.

From the technical point of view, the study starts by designing and deploying a set of interviews with individuals that either have deep knowledge of the situation under study or that are experiencing it personally, especially what meanings individuals are extracting from such experience (Bryman, 2008). This information is expected to offer a more comprehensive

understanding of the topic as well as how it is evolving in the field. It is also very helpful in building the questionnaire to make it adjusted to what is really happening.

3.2 Data Analysis Strategy

Because a mixed methods approach was adopted, data analysis strategy varies according with each nature of data and purpose of the analysis (Vogt, W.P., Vogt, E., Gardner, & Haeffele, 2014). As regards data collected from interviews, we opted to conduct content analysis. The process involves several stages as proposed by Weber (1990). Firstly, we define the unit of analysis (in our case, due to issues complexity, we opted to identify the sentence as the fundamental unit). After making this choice, Weber (1990) recommends that one should define the coding categories. In our case, because we were mostly in an exploratory stage (to gain understanding of the situation) we opted not to use an a priori set of categories.

So, we fused this analysis with the direct observation plus non-directive interviewing in the field visits and engaged in an interactive process to build new categories and understanding of the main issues that should feed the questionnaire. Concordantly, we applied the third step which consisted of codifying. Simultaneously, we tested with a small sample of the corpus if another coder reaches the same results. We asked for help from a colleague without showing our results. Findings were distinct because of our understanding of the field situation and therefore we discussed and explained our views. After some mutual adjustments and reasoning about the divergences, we adjusted some issues and deployed the full codification of the text.

This set of data was content analyzed manually and, because we opted for a posteriori coding, a very large number of categories were produced. Following Krippendorff's (2004) discussion about quantitative content analysis (mostly focused on counting frequencies to infer the centrality of categories) versus qualitative content analysis (mostly focused on extracting meanings approaching the text in a holistic way), we opted to do inferences on a more holistic way integrating data from both interviewing and direct observation. This settled categories that we included in the questionnaire as questions and items.

Data collected with questionnaires, was suitably treated with a descriptive point of view mostly due to its census status.

3.3 Interviews

3.3.1 Sample

The interviewees profile was set based on their relevancy for the research topic. To have a more comprehensive and fine target we have asked for recommendation by the HR department from Zhongshan municipality. Based on this recommendation 11 interviewees were selected. These comprise four specific and complementary profiles: 1) HR decision makers holding positions in private companies, 2) HR manager from the municipality, 3) Highly skilled personnel working in Zhongshan companies, and 4) teachers working in vocational colleges.

These profiles were selected under the assumption that diversity and representativeness of players are a requisite for a full understanding of different interpretations of reality (Yin, 2011). They were thus selected because they play different, but complementary, roles in building Zhongshan highly skilled talents. On the one hand, municipal decision makers can offer the perspective of government and the long run purpose of the 13th Strategic 5-year plan. This can be complemented by enterprises economic view and importance of highly skilled personnel and how they perceive the situation occurring in the field and what they would like to happen to improve it.

We believe that these interviews would not be complete without learning from first-person experience what means to be a highly skilled worker in Zhongshan, and so highly skilled personnel must be involved at this stage. Also, as an important official player in this whole process, vocational colleges must be included. Therefore, we interviewed six teachers that have the practical and direct experience with students.

3.3.2 Interview Script

The interview script was adapted to each type of interviewee with the purpose of

collecting different perspectives on the topic of highly skilled personnel in Zhongshan. For all players, the interview focused on:

- Characterization of current situation (industrial and productive structure)
- Characterization of highly skilled workers' working climate and policy
- Identification of problems and countermeasures
- Personal recommendation to improve situation

By placing general questions, we open way for interviewees to express their specific concerns and approach to the highly skilled personnel training (teachers), development (enterprises), planning (governmental authority) and own direct experience as the major player: the highly skilled workers themselves. Surely for each question the interviewees were not equally qualified to answer and so we took stronger consideration for information provided according with the match between each question and each interviewee (e.g. we detailed more information about highly skilled personnel policy from Zhongshan HR responsible, or more detail from working climate given by highly skilled workers, and so on).

3.3.3 Interview procedure

After recommendation from the HR and Social Security bureau from Zhongshan we made direct contact with the interviewees stating our purpose and the recommendation that was given. After this, interviews were booked to occur in person. The interviews on the corporate executives was made in July 2014 and the 11 meetings of various types at different levels involving enterprise managers, high skilled personnel, training institutions and other types were held to discuss some related problems from July to December in 2014.

3.4 Field visits

Because interviewing may not offer sufficient direct experience on the real situation where highly skilled personnel is working (or can be working in the future) we opted to complement the interview with real site visiting.

From official information collected on the profile of personnel working in Zhongshan we

selected 22 enterprises in 15 townships. These are in the Zhongshan Torch Development Zone, Huangpu town, Nantou Town, Tai Chung Town, Xiaolan Town, and Guzhen Town. The top leaders and managers from these companies have been lightly interviewed with a non-directive script with the sole intention of directly observing working settings as well as understanding each company concerns about this topic. Therefore, this information was not structured but was only helpful in having a more close and real comprehension of what is to manage each company focusing on this issue.

Besides, the author went to Human Resources and Social Security Bureau for further inspection and study in Shenzhen, Dongguan, Suzhou, and other places beyond Zhongshan city to have a wider understanding of the province of Guangdong**.**

3.5 Questionnaires

As stated, this research deploys two questionnaires: one addressed to organizational respondents and the other one highly skilled workers.

3.5.1 Questionnaires Sample

Because highly skilled personnel are officially recognized only if they are working in large sized companies (over 500 workers) we selected only these companies operating in Zhongshan. They sum up to 3075 which we set as targets for this study.

To count on their cooperation in the study, the HR Bureau from Zhongshan wrote directly to each company's HR unit stating the mandatory participation in the study. Within these enterprises all highly skilled employees were invited to participate and answer the questionnaire.

The data was collected by teams. They were especially trained from August to December 2014 and deployed for this survey and had open access to the companies. Whenever an employee was not able to answer in person, a sample of the questionnaire was left with the respective HR department requesting its completion. Because the questionnaire came under official sponsorship and responsibility of a governmental entity, participation was total which

render this sample the status of a census. Technically it is not a sample but rather a census of the population under study defined as the total number of elements (individuals or organizations) that share the same characteristics and comprise the full number of elements about which the research intends to make inference (Zikmund, Babin, Carr & Griffin, 2009). However, because of personnel changes and turnover we must admit a minimum variation, although because the time window for data collection was tight, in practical terms we consider this a census. This implies that inferential statistics are not necessary as it only applies to representative subsets of the population.

3.5.2 Measures for Questionnaire 1 (workers)

The interviews and direct observations suggested five topic sections should be included in the questionnaire besides a section on sociodemographic data. So, topics such as the level of salary and benefits, as well as the company's awareness and degree of importance given to highly skilled professionals, and job satisfaction emerged from interviews. Then, several HRM related practices were structured according with their affinity. So, topics concerning training, job rotation and career management were also considered. Lastly, at the institutional level, topics concerning governmental support and expectations / preferences were also considered.

Therefore, the questionnaire comprehends six sections. The first one concerned basic sociodemographic variables, namely age group, gender, education, professional qualification (if any), type of occupation, and household costs.

The second section concerned the present working status variables, namely the perceived degree of importance the company attaches to highly skilled talents (measured on a 4-point rating scale from 1=great importance to 4=no importance at all), job satisfaction (measured on a 5-point Likert scale from 1=very satisfied to 5=very unsatisfied) followed by an open answer about aspects that caused satisfaction and dissatisfaction from a list of five possible options (1=Salary, 2=Promotion, 3=Social climate, 4=Employment opportunities, 5=Other). In case "Other" was chosen, the participant was requested to state which one. Additionally, participants were asked to state their perception of the degree they were able to develop their

professional expertise (measured on a 5-point rating scale from 1=very fully to 5=difficult to develop).

A third section concerned salary, welfare and living conditions. It asked for the level of monthly average salary (1=1500 to 200 RMB, 2=2001-3000 RMB, 3=3001-5000 RMB, 4=5001-800 RMB, 5=8001-10000 RMB, and 6=10001 RMB or more) followed by the level of personal satisfaction with the salary (5-point Likert scale from 1=very satisfied to 5=very unsatisfied). Participants were asked also if the company provided them with social security (1=yes, 2=no).

A fourth section concerned training and career development. It started by asking how frequently the company provided participants with skill training (measured in a 4-point frequency scale from 1=never to 4=many times) followed by the level of satisfaction with skill training offered by the company (5-point Likert scale from 1=very satisfied to 5=very unsatisfied). Then it asked if the participant had any skill training in the last three years (1=yes, 2=no) as well as the extent that their skills and knowledge meet the needs of their job (1=fully meets to 5=unable to meet). The questions move on to identify the participants' plans to further improve their skill level (1=yes, 2=no) and it ends by asking what is the personal opinion about the most effective way of training (measured on a nominal scale, 1= technical school, 2=social training organization, 3=enterprise training, 4=network training, and 5=other. In case other was selected the participant was requested to state which one).

The fifth section concerned internal flow and occupational mobility. It comprehended only two questions: one pertaining how frequently has the participant changed his/her job (measured on a 4-point scale, 1=none, 2=once, 3=two or three times, 4=above three times), and another question pertaining the motives for such job changes (measured as open fields up to three motives chosen among a list of possible four motives: 1=enterprise development prospects, 2=personal development opportunity, 3=salary and welfare treatment, and 4=working environment conditions. In case it does not apply, the fields should be left empty).

The sixth section concerned the interaction between government and enterprises and governmental support. It started by requesting the level of satisfaction with the city municipality's policy on talent development (5-point Likert scale from 1=very satisfied to

5=very unsatisfied). It followed by asking personal opinion about the sort of support the municipality should offer to leverage highly-skilled talents in the city. The participant was requested to fill in up to three from among a list of possibilities (1=funding input, 2=skills training, 3=technical guidance, 4=regular promotion, 5=endowment funds protection, 6=preferential policies for talents' children entry school, 7=optimizing the working environment, and 8=others. In case the participant opted for "other" it was requested to state which one). After providing these opinions, participants were invited to state their level of satisfaction with specific issues with a 5-point Likert scale (1=very satisfied to 5=very unsatisfied). The specific issues were: Give employment and business starting guidance, assist with spouse employment, facilitating children entry in school, provide medical and healthcare service, provide social security protection, other services (listing out freely). For each issue the participant was requested to write the areas for improvement. This section ended with asking the participants to freely write a text about their personal suggestions on how the government and enterprises could do to work of the construction of highly skilled talents in Zhongshan city.

3.5.3 Measures for Questionnaire 2 (Enterprises)

Designed from the interviews and field visits, when targeting the organizational decision-makers domain, this questionnaire (addressed to enterprises) also comprehends six sections. The first section focused on basic organizational information comprehending the name of the company, its size (measured as number of employees, expressed on a magnitude scale where 1=<500, 2=501-1000, 3=1001-3000, 4=3001-5000, 5=5001-10000, and 6=10001 and above), the type of organization (1=state-owned enterprise, 2=private, 3=sino-foreign joint ventures, 4=foreign enterprises – including Hong-Kong, Macau and Taiwan), and 5=other. Asking to indicate which one). To understand the type of business we asked for the sector (1= electronic information industry, 2= equipment manufacturing, 3=health pharmaceutical manufacturing, 4=new energy industry, 5=textile and garment industry, 6=electrical machinery and metal products manufacturing, and 7=other. In which case we asked to state which one). Additionally, we asked for the traditional industry the enterprise belonged to (1=lighting industry, 2=hardware products industry, 3=textile and garment

industry, 4=Mahogany furniture industry, 5=Home appliance, and 6=other. Asking to indicate which one). We included also three questions to feature the Human Resources in the enterprise. Namely:

- The number and structure of skilled talents (where the respondent was expected to register the number of employees falling in the following categories: Senior technicians Level 1, Technicians Level 2, Senior workers Grade 3, Intermediate workers Grade 4, Primary workers Grade 5, and Skilled workers without certificate).
- For these same professional categories we asked the average monthly salary (in Yuan Renminbi).
- The relevant awards received including qualifications, patent applications, research awards or similar acquired by skilled talents. The respondent was expected to state the number (if applicable) of awards received according to its scope: National level, Provincial level, or Municipal level.

A second set of questions addressed the demand for high skilled personnel in enterprises. The first two questions pertained the description and prescription of the percentage of highly skilled personnel within enterprise (1=<10%, 2=11-20%, 3=21-30%, 4=31-40%, 5=41-50%, and 6= equal of above 51%). The first one asked for current situation and the second one asked for ideal situation. This offers us an estimate of demand. We then asked the respondent to indicate among a list of professional categories which were the three most highly skilled talents in shorter supply (1=senior technician, 2=technician, 3=senior worker, 4=intermediate worker, 5=primary worker, 6=skilled workers with no certificates) followed by the estimated number corresponding to each one of these categories in urgent need of recruitment.

The third section focused on Recruitment and Selection channels to attract high skilled personnel to the enterprise. It comprehended two questions only. The first one focused on attraction channels ("What is the most important channel for enterprises to introduce highly skilled talents?") and offered six possibilities (1=social recruitment, 2=enterprise training, 3=school enterprise joint training, 4=by local technician school or training institutions direct recruitment, 5=to recruit from other provinces, and 6=other. Asking to indicate which one). The second question focused on opinion about the best channels to attract more highly skilled

talents. The answer options were: 1=training of technical schools in this city, 2=training in enterprise by themselves, 3=training by cooperation between schools and enterprises, 4=recruiting from other cities, 5=cooperation and exchange with vocational schools in other cities and 6=other. Asking to indicate which one).

The fourth section concerned training of highly skilled personnel. Respondents were requested to state if there any training plan for highly skilled personnel in their enterprise and if so if it was of a short-term or long-term nature). Then we asked about which was the most important way enterprises could train their highly skilled personnel (1= recruiting external teachers, 2=internal expertise staff training (internal training), 3=select staff to go out for further education, 4=employees improve their skills on their own, 5=master-apprentice method, 6=employees join in national examination, 7=other. Asking to indicate which one).

The fifth section of questions focused on retaining highly skilled personnel. It started by asking in a 5-point Likert scale to which extent the current treatment of highly skilled personnel was effective in attractive for employees (1=Very attractive to 5=Not attractive at all). Then we asked the respondent to choose as many of the following measures that were judged as effective in retaining highly skilled employees (1=raise salary, 2=improve the incentive system, 3=improve the guarantee system, and 4=improve the training system, 5=some other way, asking to state which one). We completed this bloc by asking the respondent to signal (as Yes or No) the existence of five possible retainment policies (1=professional skill identification plans, 2=income preferential policies to skilled talents, 3=linking income to skill level, 4=establishing an allowance system for highly skilled talents (skilled workers, technician, and senior technicians), 5=establishing a reward system for highly skilled talents contributing to the enterprise).

The sixth section comprehended four questions. The first measured in a 5-point Likert scale (1=very satisfied to 5=very dissatisfied) the respondent’s degree of satisfaction with Zhongshan municipal government’s existing talent policy. The second question asked for opinion about the most effective measures to strengthen the construction of highly skilled personnel amongst the following: 1= provides family housing service, 2=provides children's access to school, 3=innovative talents management mechanism, 4=the promotion of concept

of talent management, and 5=other, asking to state which one). The following questions are of a similar nature but addressing policies to support the development of enterprises (1=connecting with overseas, 2=training and introducing, 3=attracting investment and talents together, 4=inviting money and business, 5=win-win benefits with other cities in China) and specific policies to support the increase of highly skilled talent in enterprises (1=policy support, 2=funding support, 3=incentive support, 4=optimize environment, or 5=other, asking to state which). Lastly, we asked for an open answer on possible suggestions the respondent had for the government to enhance the professional ability of skilled talents).

Chapter 4: Results

4.1 Analysis of the Construction of Zhongshan's Highly Skilled Talents

This chapter presents the descriptive results from both surveys. As stated, because this is a census-based research, information extracted is not a sample but rather the full range of the population under study. In this sense, the inferential statistics are unnecessary. The figures represent the entire population under study (enterprises and highly skilled workers) in Zhongshan.

The chapter evolves by showing upfront 1) the sociodemographic findings for highly skilled personnel in Zhongshan, and then 2) systematically depict the public policies destined to anchor highly skilled personnel in Zhongshan (household registration, children school registration, subsidy to winners of nation-wide or province-wide skill awards, self-training subsidies, citizenship to qualified migrant workers) as well as those policies destined to develop skills (standardization of training, reinforcing vocational schools capacity in numbers and connections to enterprises). Within this section, the chapter moves on to depict the role enterprises took in the construction of highly skilled personnel in Zhongshan (in promoting training both in-house, by establishing Corporate Academia, enacting knowledge transfer from experts to workers or incentivizing employees to study outside). Bridging both public authorities and enterprises, the chapter explores the policy of simplifying bureaucratic processes for household transfer (registration, rental), the creation of a big social event aimed to attract investment and recruit talents, encourage enterprises to improve well-being (by fostering a positive culture and working climate, and implementing flexible incentives and rewards). At a third moment, the chapter explores the problems related with the construction of highly skilled talents in Zhongshan (insufficient number and uneven distribution per category and type of expertise, high mobility outwards of Zonhgshan) but also the causes attributed by employers and employees (low professional development opportunities, non-competitive salary level, and benefits, unfavorable social representation of talent worker, misaligned education and qualifications from economy needs, competency-low impact of

education, high mobility, motivational profile of skilled workers, poor incentive systems amongst others).

4.2 Sociodemographic Structure of High Skilled Personnel

In recent years Zhongshan’s enterprises especially those with considerable scale have greatly increased while industrial size and upgrading expanded and accelerated respectively. Under this new situation and based on "the Opinions on Further Strengthening the work of high skilled personnel" proposed by the central government, Zhongshan has reformed the household registration system, talents training modes and supplements for high skilled people to make them better cultivated, used and further explored. Ultimately, a contingent of highly skilled personnel of nearly 100 000 with higher education at early age has been formed.

According to our survey of 3075 enterprises, the highly skilled talents make up 34.8% of the skilled workers, the proportion of which is higher than that of the national forecast in 2015 (27%) and the expected proportion of the whole province in 2015 (28%). The young high skilled talents are playing a progressively important role in the industrial development with their quality and quantity increasing at a fast speed.

This is relevant for the study as it relates with the principle of policy effectiveness. Findings indicate that because of the high priority placed upon the construction of high skilled workers by the 13th Strategic 5-year Plan, the proportion of highly skilled talents overpasses the threshold 27% forecasted in 2015. Being so, we can conclude that the enterprises and the overall society in Zhongshan is fully committed with this strategic priority.

4.2.1 The Proportion of High Skilled Talents in the Total Number of Employees

As shown in Figure 4-1 ordinary workers account for a large number (75%), and other skilled workers make up a relatively low number of 16.3%, while senior and above technicians consist of only 8.7% of the total number of employees in the surveyed enterprises.

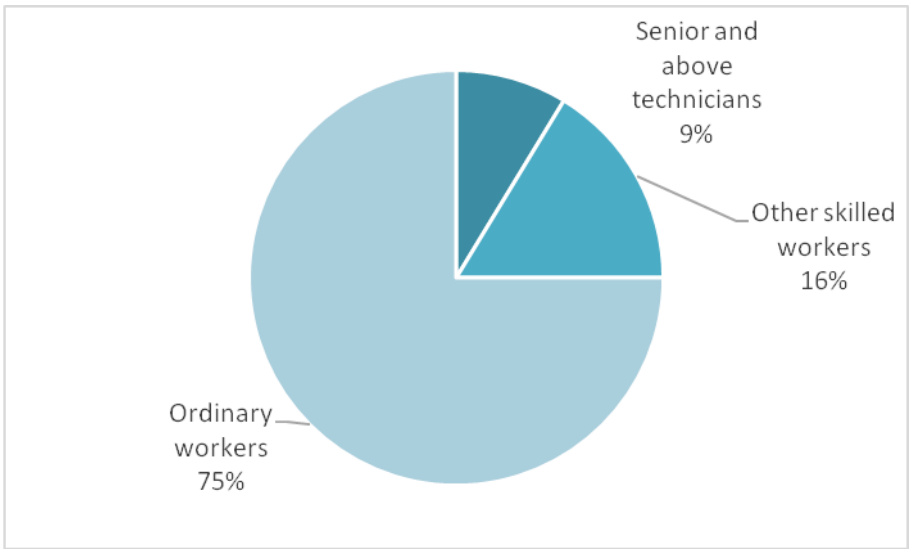


Figure 4-1 The proportion of high skilled talents in the total number of employees

4.2.2 The Age Structure of High Skilled Personnel

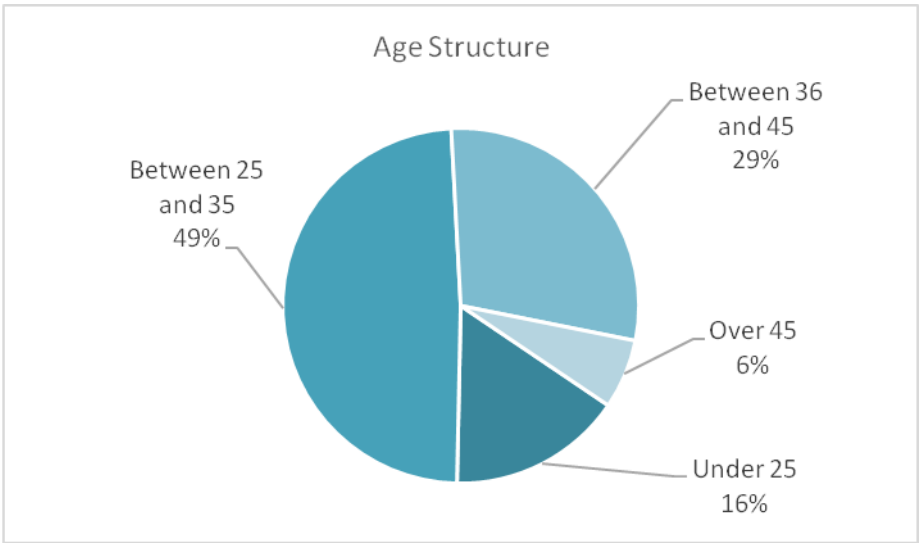


Figure 4-2 Age structure of high skilled talents

Figure 4-2 shows that the talents under the age of 25 take up 15.9%, between 25 and 35 years old occupy 48.8 %, those between 36 and 45 make up 29% while talents above age 46 are 6.3 % of the surveyed talents. It also can be shown that the proportion of talents between the age of 25 and 35 is larger that of talents between age of 36 and 45, while the smallest proportion is the proportion of talents above the age of 45. It implies that enterprises are innovative with a large contingent of talents because these cumulate 64.7% with ages up to 35 years old. It may also suggest a counterproductive effect slowing down the development because young workers are active, emotional, passionate and prone to leave for new jobs. This

may translate into higher turnover rates as well as periods of regionally bounded labor shortage.

Still relating with the same principle (that of the policy effectiveness), findings show that younger workers account for a large proportion of highly skilled talents. This is evidence that the investment in education is changing the demographics of highly skilled workers in Zhongshan with an emphasis on the renewal of HR rather than recycling and updating. This is a strong point in favor of the strategic purpose of rejuvenation of China.

4.2.3 Sex Structure of High Skilled Talents

Amongst the employees surveyed, male employees account for 58.3% of the total, while female employees account for a relatively lower percentage of 41.7%. This shows that men occupy the dominant position in work settings. From a longitudinal comparison, this proportion is roughly the same as that of the registered population in Zhongshan. However, from the Figure 4-3 the men at high skill level are almost two times as much as women, and the smallest gap is at the level of primary workers so the women with high skill level are very few.

	Percentage（%）	
	Men	Women
Primary workers	7.6	4.5
Intermediate workers	8.5	4.0
Senior workers	6.1	2.3
Technicians	3.1	1.5
Senior technicians	1.5	0.5
Skilled craftsmen	31.6	28.9
total（100%）	58.3	41.7

Figure 4-3 Sex distribution of the skilled personnel

Gender is another issue that relates with the principle of policy effectiveness. Findings suggest that the progress made in gender equality at work is not still attained amongst

unskilled and highly skilled workers. In high skilled personnel there is evidence of more gender inequality which means this principle is yet not realized. Gender equality is important not only because of the ethical principle but also because there is no reason for the potential for talent to be distributed in different proportions between men and women. By not fully attaining this goal of gender equality, the system is not fulfilling its aim of maximizing the transformation of potential talent into real talent.

4.2.4 The Academic Structure of the High Skilled Personnel

The results of the survey show that among the employees surveyed primary school or less degree graduates, junior high school graduates, high school graduates, secondary vocational school graduates, junior college graduates and undergraduates take up almost more than half number of the total workers surveyed (with different percentage as showed in Figure 4-4. Those with a master's degree and doctoral degree account for only 0.7% and 0.2% respectively. Generally, the education level of talents reflects the stock and quality of human capital. Overall, the secondary vocational school graduates and level below college graduation are more than 50%, while the post-graduation students and doctoral qualifications are not more than 1%. It implies that high quality talents are still lacking, which will inevitably restrict the long-term sustainable development of the enterprises.

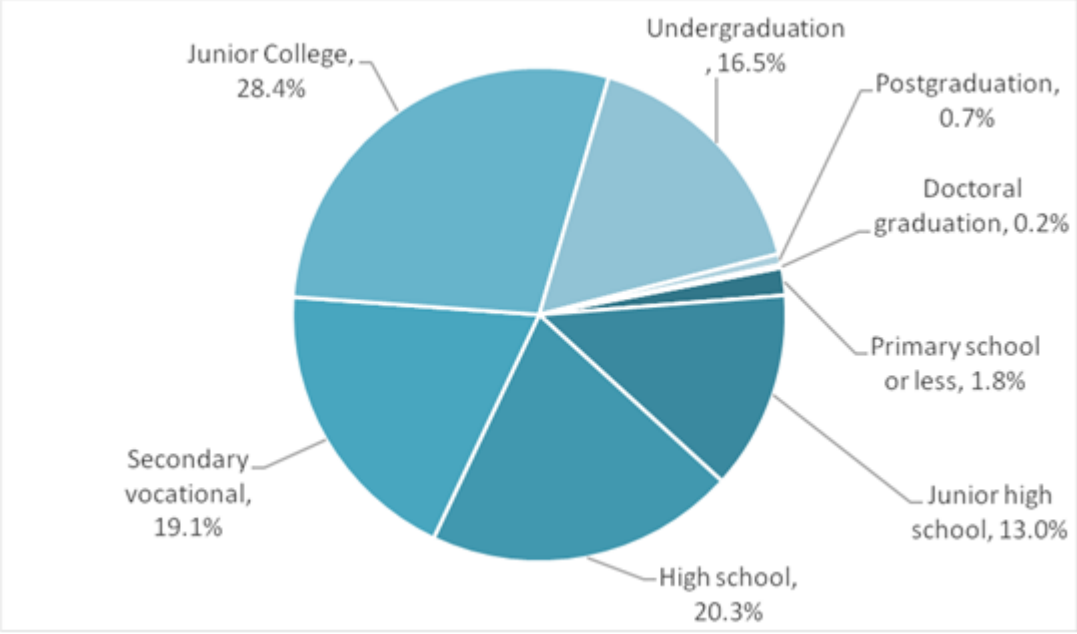


Figure 4-4 The schooling structure of high skilled personnel

Lastly, the representation is high educational qualifications at the post-graduation level is still very incipient in the market. This means there is room to invest largely in post-graduation studies.

4.2.5 The Industrial Distribution of High Skilled Workers

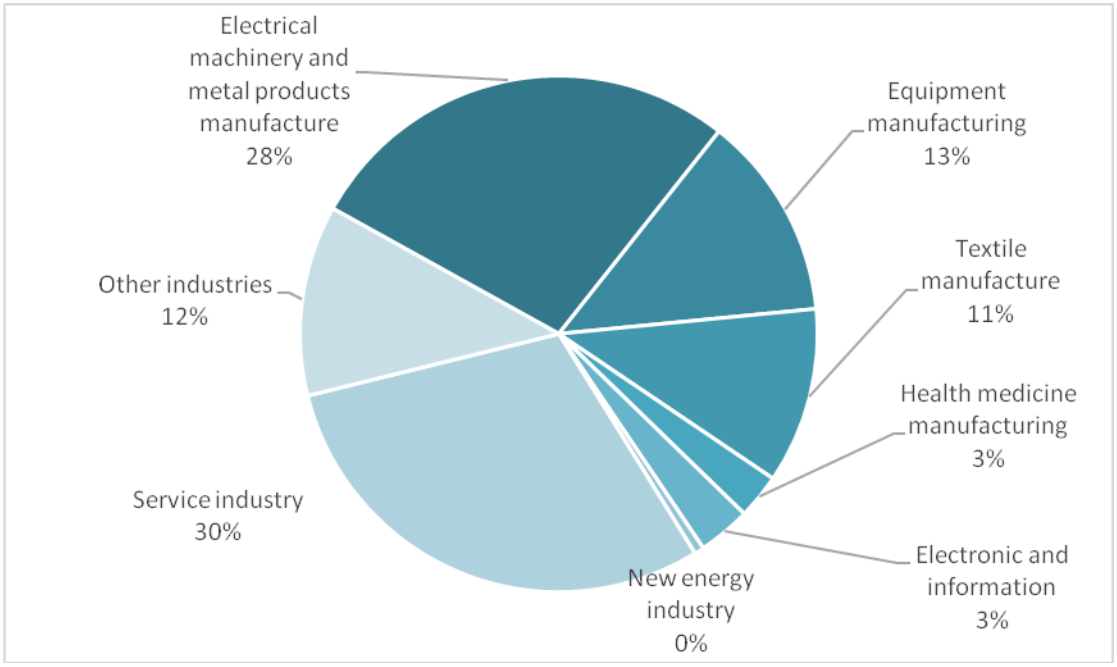


Figure 4-5 The industrial distribution of highly skilled talents

The distribution of highly skilled talents in the different industries is showed in Figure 4-5. The proportion of high skilled personnel in the second and third industries is 54.8 against 45.2, which is basically consistent with the proportion of the industrial structure of Zhongshan in 2013. The manufacturing industries takes up 54.2% of high skilled personnel. Specifically, they occupy different percentages in electrical machinery and metal products manufacturing industry, the equipment manufacturing industry, and the health medicine manufacturing industry with 27.6%, 12.8% and 2.8% respectively.

4.2.6 Level Structure of High Skilled Personnel

Figure 4-6 details data showed before concerning the structure of highly skilled personnel professional level.

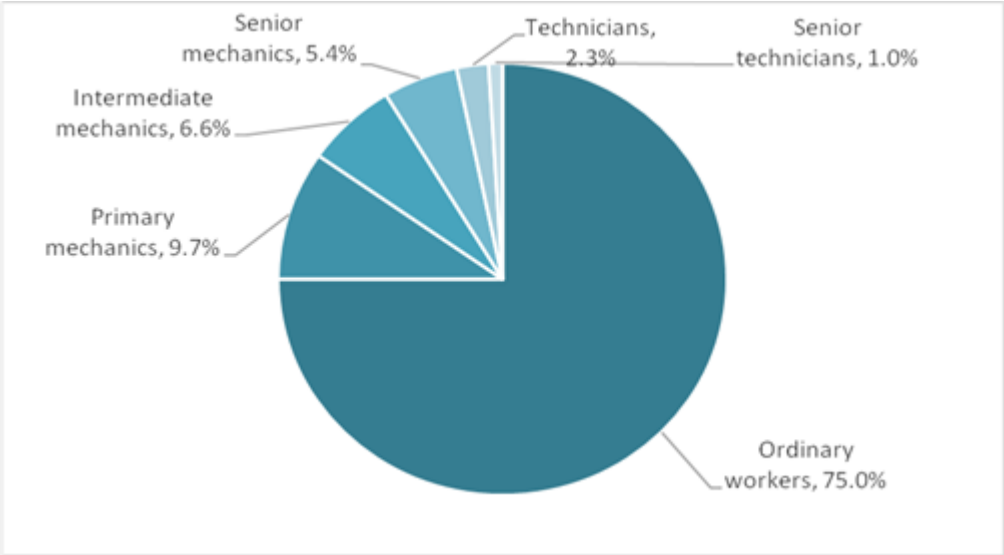


Figure 4-6 The proportion of high skilled talents at various levels

Figure 4-7 shows the distribution map of highly skilled talents according to the “four don’ts” (do not choose talents according to academic qualifications, professional titles, qualifications, and identifications). From this graph we know that skilled craftsmen without high skill certificates are 73 500, accounting for 59.5% of the total of the actual high skilled personnel in the enterprises, more than those with high skill certificates.

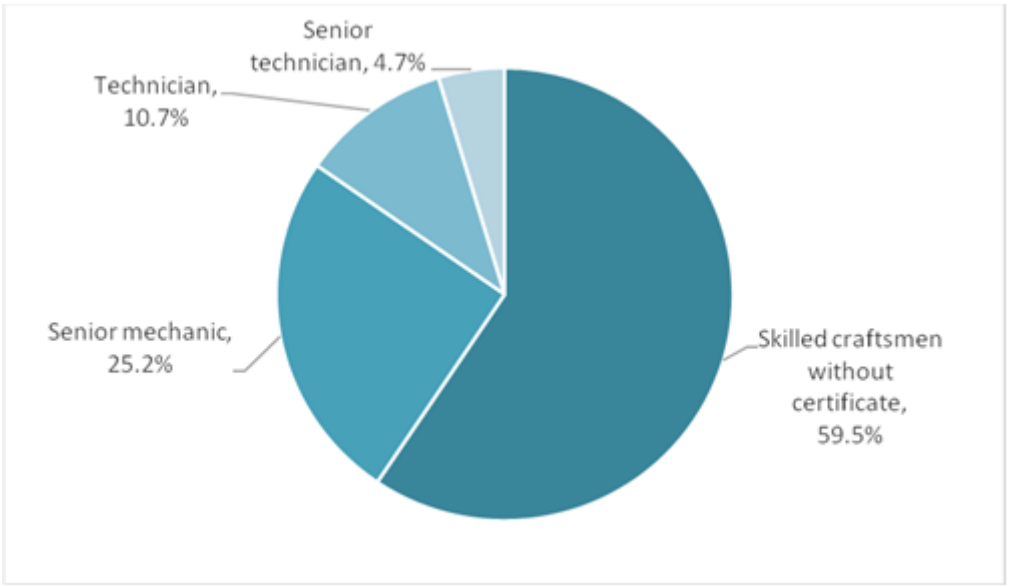


Figure 4-7 Distribution map of highly skilled talents according to the "four don'ts"

Also, findings indicate a large quantity of highly skilled personnel with no high skill certificate. This means that there is a hidden capacity regarding highly skilled personnel that

may pass unnoticed if the traditional requirement of academic qualifications is used.

4.3 The Present Situation of the Construction of High Skilled Personnel

4.3.1 Recognition of Highly Skilled Talents

4.3.1.1 Pioneer in Introducing Household Registration System for High Skilled Personnel

In December 2005, Zhongshan was the first city to carry out points-based Hukou System or household registration system for high skilled personnel in the town, and came up with *the measures for introduction and management of Zhongshan skilled personnel* (Zhongshan Municipal Government Office, 2005, No. 115), which makes it clear that non-local men under the age of 45 years of age and women under 40 years of age acquiring senior mechanics and up vocational qualification certificates may apply for household registration system. After the issuance of *opinions on the work of household registration system for high skilled personnel, 2012* (Guangdong Municipal Government Office No. 66), Zhongshan issued *the opinions on the implementation of household registration system for high skilled personnel in our city*, which confirms that skilled talents with senior mechanics, technicians and senior technicians with high professional qualifications are all allowed to be registered in urban households. Zhongshan has removed barriers to household registration and restrictions on applicants' age and their children's migration to create a green channel for the introduction and retention of highly skilled talents. From December 2005 to the end of 2014, more than 2300 highly skilled talents were transferred to Zhongshan households through this channel.

4.3.1.2 Increasing the Quota of Household Registration System for High Skilled Personnel

Since some highly skilled personnel are reluctant to bring personnel documents to Zhongshan for certain reasons or just willing to make their children study in local schools, Zhongshan has continuously adopted relevant preferential policies to increase the quota of household registration system for high skilled personnel as a pioneer in implementing the

management of mobile personnel integration system in the whole country. It proves to be effective when more and more high skilled talents are able to achieve their household registration or their children's school admission. From 2010 to 2014 when the policy of household registration system was adopted, the numbers of high skilled talents who achieved household registration and children's school admission were 14 765 and 37 781 respectively.

4.3.1.3 High Skilled Talents Being Included in the Reward Range of High-level Talents

The document "*opinions on further accelerating the training and introduction of qualified talents*" (Zhongshan municipal Party committee of the Communist Party of China, 2010, 7) issued in August 2010, made it clear that the winners of the China Skill Award, the National Technical Expert and the Provincial Technical Expert can be recognized as the high-level personnel and enjoy the special subsidy of more than 1000 RMB per month according to the different levels for a 3 years payment by the municipal government and more than 100,000 of house purchase subsidies to make them achieve household registration and children's school admission. This practice of integrating high skilled talents with outstanding ability into the management of high-level talents has motivated high skilled personnel to work in Zhongshan.

4.3.1.4 The Rural Labor Force Skills Training Subsidies and High Skilled Personnel Self-training Subsidies

Since 2008, Zhongshan city has integrated the vocational skills training of rural labor force into the annual working plan and decomposed the work plan into various towns to standardize the training and improve the quality of training. The whole city has trained 132 000 rural labor forces and trained 49 000 high skilled personnel, and for the past years Zhongshan was always among the top of the province in the assessment of the work of rural labors skills training. In July 2013, high skilled personnel self-training subsidies was introduced, and the restrictions on regional and household registration were abolished, while the self-training subsidies was extended to all employees. Employees who gained certificates of senior mechanics and above qualification certificates by training can enjoy 2000 RMB subsidies. Since the implementation of the new policy more than 1100 people have applied for self-training subsidies and 1.689 million RMB has been issued successfully. The

implementation of the new policy has greatly promoted the enthusiasm of the staff to become high skilled personnel. In 2014, the number of senior mechanics and above skilled talents was 31% higher than that of the previous year.

Facing the challenge of talents competition and high skills shortage in the surrounding areas of Guangdong Province, Zhongshan municipal government accelerated the pace of giving citizenship to migrant workers by promoting the skills investment and accumulation of migrant workers. The purpose of "household registration system" is to improve the employment security of migrant workers and help them realize the transformation of their household registration status by certain social protection policies in a feasible range, thus the high skilled migrant workers may be stabilized to participate in skills training and their children may acquire more skills by general and vocational education. Since 2004, the policy of giving citizenship for migrant workers in Zhongshan can be divided into two categories: employment policies and social security policies. Employment policy is a direct intervention of the government in the labor market. Its purpose is to eliminate policy barriers and ensure the fair employment rights of migrant workers. Social security policies include both national policies and special policies in Zhongshan. The "household registration system" policy in Zhongshan has strengthened the role of education and skills, social security and labor contracts in the transformation of social status and provided conditions for the regeneration of the social mobility of technical skills assets. This shows that under the market economy system, local government may help the migrant workers to realize the citizenization by improving the supply of local public goods, to encourage the related groups to invest in skills and solve the problems of the shortage and mismatch of the local economic development skills. It can be shown as Figure 4-8.

Relating with the principle of facilitation, public policies to anchor highly skilled personnel in Zhongshan (namely by easing household registration, children school registration, subsidies to winners of skill awards, and citizenization of migrant qualified workers) are effective in the purpose of attracting and anchoring highly skilled personnel.

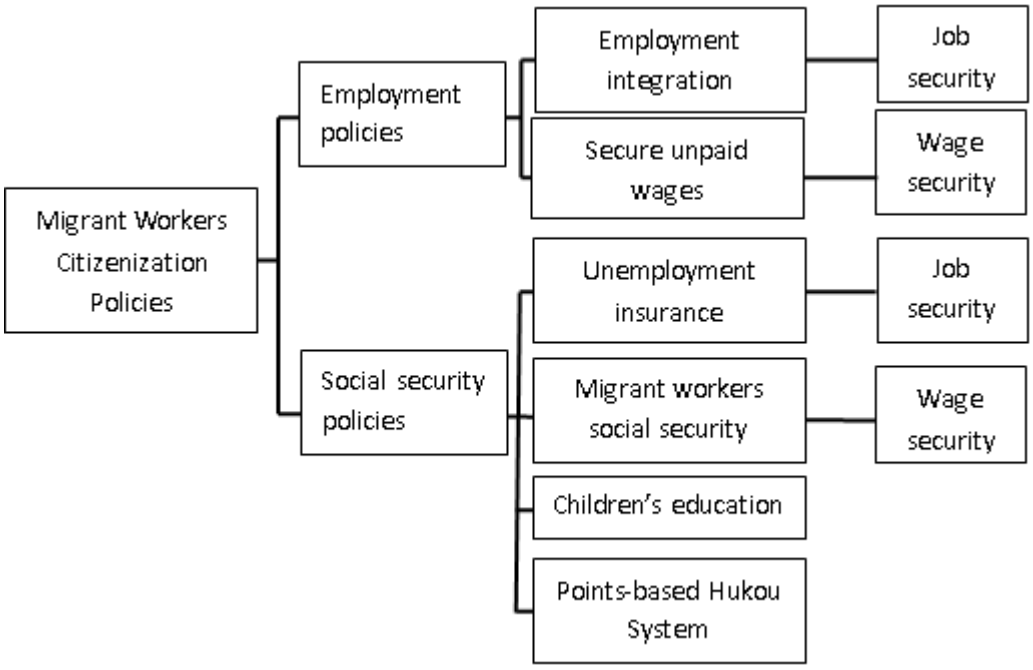


Figure 4-8 Migrant Workers Citizenization Policies and Incentives

4.3.2 Gradual Establishment of Training Platforms for Highly Skilled Talents

After years of great efforts, Zhongshan has found its own way to create a training system for high skilled talents. That is, guided by municipal government different training modes were combined to train skilled talents including the full-time training of vocational schools, the short-term training of social institutions and the post training of enterprise. The training modes are listed as follows.

4.3.2.1 Government Guidance

Since 2008, Zhongshan has brought the skills training of high skilled personnel into the annual work plan, and issued the "*Implementation plan of Zhongshan rural labor skills training and transfer employment* " (China Agricultural Industry Office, 2008) which made the target into relevant responsibility units. In strict accordance with the "*notice on the acceptance of the skills training projects for rural labor and the application of funds*" (Guangdong Ministry of human resources and social security, 2011), Zhongshan has worked out the training plan and the course arrangement for the related work.

So far, the management of training ledgers has been improved and designated training institutions and practice training facilities have been standardized. According to statistics,

from 2008 to the end of 2014, 110 000 rural labor forces and 48 500 highly skilled personnel were trained in the whole city. In 2013, the transfer of rural labor skill training was the first in the whole province, and more than 50 000 people were trained and introduced in the whole year, and the increase was 18.6%.

4.3.2.2 Full-time Training in the Vocational Schools

To promote industrial transformation and upgrading to accelerate the construction of modern vocational education, Zhongshan city has invested 1.6 billion RMB successively for layout adjustment and basic capacity building of secondary vocational schools. In recent years, more than 5000 high quality study positions in vocational education have been added, and the Zhongshan Vocational Education Park covering an area of 3000 m2 in Wuguishan was built. At present, there are two municipal vocational and technical colleges, one provincial vocational and technical college, and 27 400 full-time vocational school students. There are 13 secondary vocational schools (11 state-run and two private schools), of which three are the first model secondary vocational schools, one demonstrational secondary vocational schools in Guangdong, two national key secondary vocational school, seven provincial key secondary vocational schools, and nearly 40 000 students in full-time secondary vocational schools.

At the same time, the "Zhongshan vocational education model" has been formed after deeply reforming the school system and talent training mode and promotion of school enterprise cooperation.

The principle of priority established in several countries indicates a privilege place of vocational training in the investment decisions. From data collected, findings suggest that vocational training is indeed a core player in developing highly skilled workforce in Zhongshan.

There is evidence of this policy effectiveness because the employment rate of vocational college graduates in the city has reached more than 99%. Additionally, in the past two years, students participating in the national and provincial skills competitions won 38 national and 245 provincial honorable awards achieving remarkable success. For example, based on the school enterprise cooperation mechanism, Zhongshan Polytechnic has innovated the construction mode of productive training base by a new way of combining internal school

with external enterprise investment together.

This new model proves to be truly successful when the first employment rate of vocational college graduates greatly increased from 2012 to 2014 with the numbers of 98.09%, 97.58% and 99.13% respectively, while the employment in Zhongshan was 83.7%, 86.05% and 74.25% respectively. In addition, the employment rate of Zhongshan Torch Polytechnic from 2012 to 2014 is 99.91%, 99.13% and 96.09% respectively. Skilled talents with professional counterparts are very popular in enterprises. In the past over 10 years, the University of Electronic Science and Technology of China, Zhongshan Institute has held a special recruitment fair for graduates every year. In 2017, there are 448 recruited enterprises from 68 categories of more than 10 industries coming from Shanghai, Tianjin, Guangzhou, Shenzhen, Qingdao, Dongguan, Zhuhai, Zhongshan, Hongkong, Singapore and other 16 countries, regions, and cities. The enrollment rate of college entrance examination is the first in eight consecutive years, and the overall level of vocational education is at the forefront of Guangdong province.

4.3.2.3 Short-term Social Training Institutions

In recent years, social training institutions have been developing healthily with the support of the local government policies. At present, there are 45 private vocational training schools referring to 112 types of work appropriate for training. Training institutions provide short-term training for social workers and employees, which provide a convenient way for them to improve their skills. Zhongshan Xianmei School, founded in 1988, has trained thousands of professional hairdressers for Zhongshan. It initially sets up the "three stage" teaching method for beauty salon, which is well received by the industry and students. Zhongshan Zhuo Li Consulting Management Co., Ltd. and other units have jointly opened the "Zhuo Li Big Forum", which has been held for several periods; Zhongshan Technician College has first created the "school enterprise dual system class" or a non-full-time class in application of electronic technology, and the Municipal Human Resources Association and the Huangpu town chamber of Commerce have organized the special training classes of the enterprise human resources work; and the Shaxi county held a symposium on promoting school enterprise cooperation to speed up the training of skilled personnel, and Tanzhou,

Gangkou, Huangpu and other towns held several training classes, self-training classes, and held the activities of "sending training courses into enterprises and the countryside".

4.3.2.4 The Inner Enterprises Training

With the rapid economic development, more and more enterprises begin to attach importance to the promotion of on-the-job training for employees. Figure 4-9, shows that 71.2% of the surveyed enterprises have made training plans. Figure 4-10 shows that 53.1% of highly skilled talents in enterprises depend on enterprise training, and only 46.9% of them are directly imported from outside. Training of highly skilled talents mainly occurs through internal training and master transmission mode with percentages of 32.1% and 27.6% respectively (Figure 4-11). Many enterprises have established their own training schools, such as Vatti lighting, Huayi lighting, ocean motor, Xia Lake family, Topstrong set up home and so on. Zhongshan Tianmao Battery Co. Ltd. and Tanzhou polytechnic school successfully held a staff college entrance examination training class. Sotech Machinery and other enterprises enable technical experts to give lectures 1-3 times a month which has trained teachers.

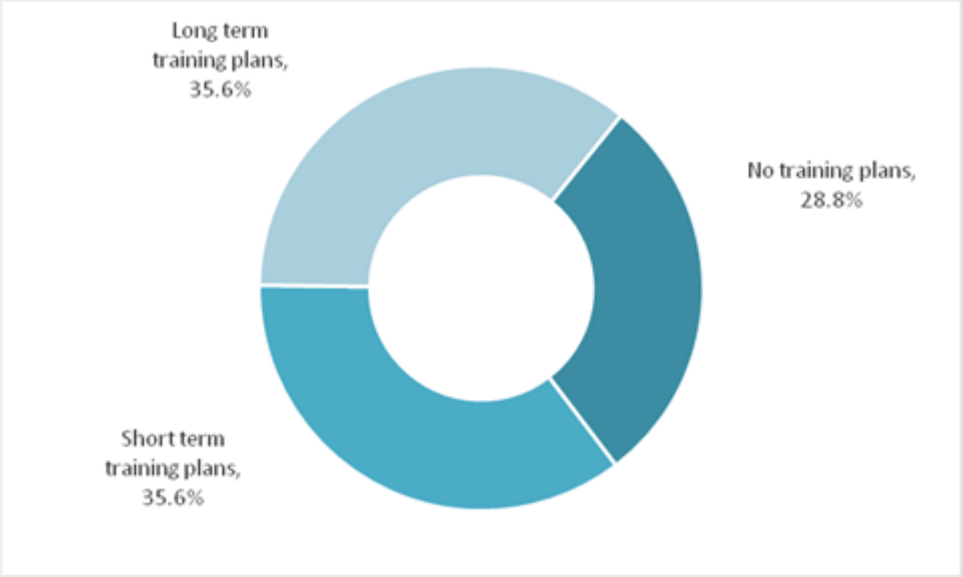


Figure 4-9 Training plans for high skilled talents in the enterprises

The important principle of participation or co-construction that bridges education and enterprises is in set in Zhongshan. Stakeholders see enterprises as important players in the construction of highly skilled workforce and enterprises also positively react to official priority to invest in skill construction in Zhongshan.

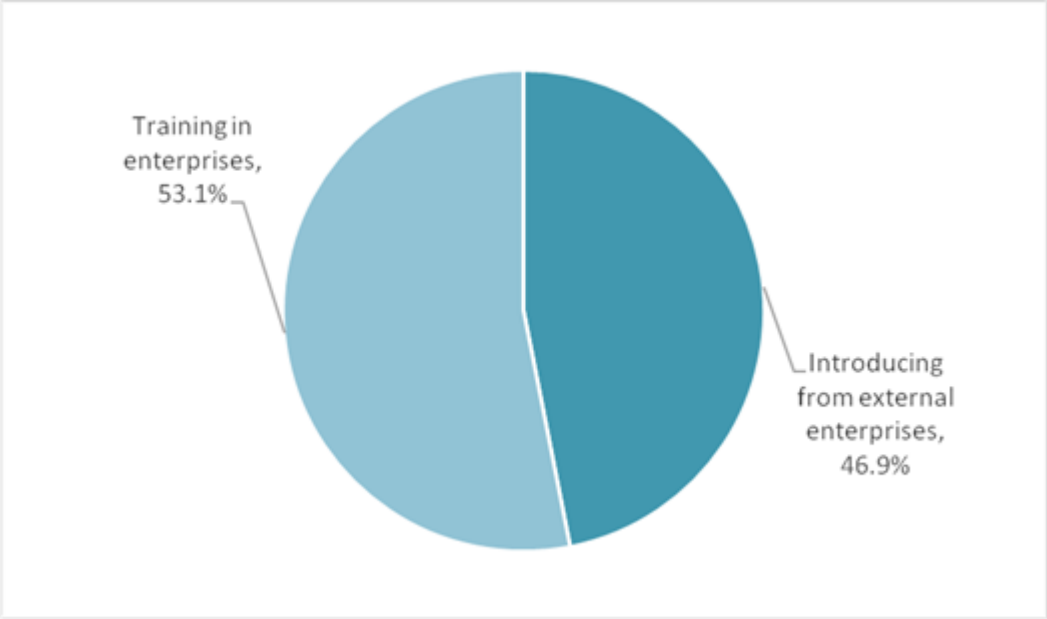


Figure 4-10 Introduction ways of high skilled talents in the enterprises

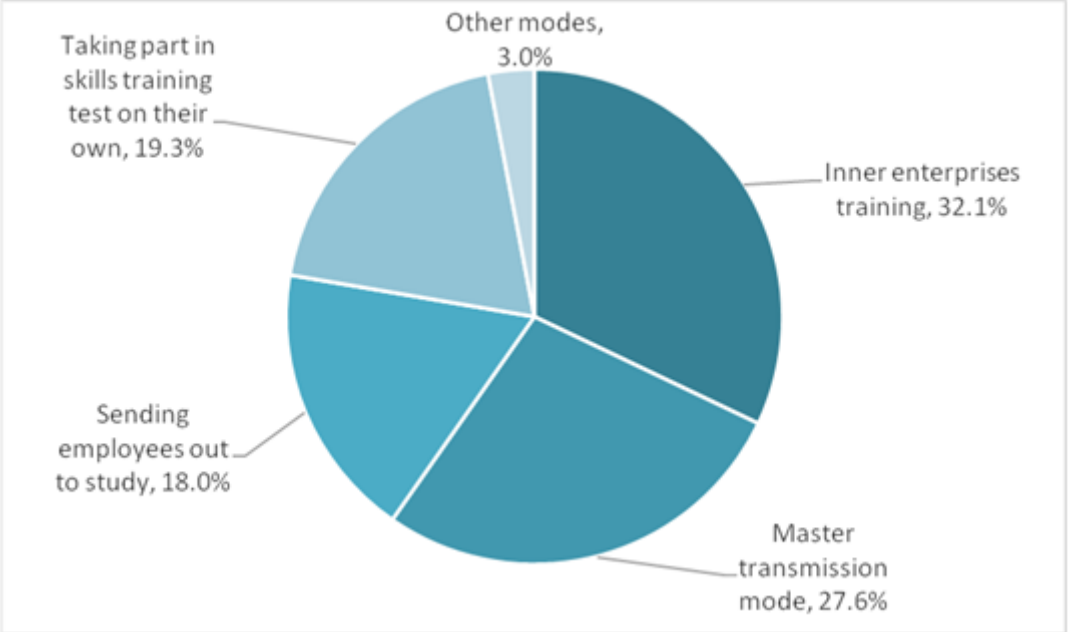


Figure 4-11 Training modes of high skilled talents in the enterprises

4.3.3 Strengthening Services Offered to Highly Skilled Talents of Enterprises

4.3.3.1 Convenient Household Transfer

The Zhongshan Municipal Human Resources Social Security Bureau has set up the "one-stop" service window for the introduction of high skilled talents in the people's livelihood office of the municipal government, which is responsible for the full transfer and entry of high skilled personnel. After the required information is ready, the applicant may

submit the related data to the business reception window at one time which then pass the information to the Public Security Bureau, the Municipal Bureau of population planning and the personnel department of the town area to conduct the review which will be completed within 20 working days until the transfer (entry) notice is issued finally. This process greatly improved the efficiency and convenience for the household registration of high skilled personnel.

4.3.3.2 Being Active in Solving Practical Problems of High Skilled Personnel

Since many highly skilled personnel have practical problems such as children's admission and housing, Zhongshan has reformed relevant policies to let more people achieve children's admission and public rental housing. According to a public notice, the population of mobile personnel managed by the integral system in 2014 was 13 200 including 6 762 students in the first grade of the public primary school and 6 438 in the public junior middle school which increased by 4 400 than that in 2013 (a 50% increase). The points-based Hukou quota of the whole city was 4 000, which was 400 more than in 2013 or 11% increase, and the quota of public rental housing was 500 sets compared with the 200 sets in 2013, increased by 300 sets (a 150% increase). Compared with the only seven public rental housing projects in Tai Chung Town, Nun Lang Town, Xiaolan Town Shanxiang Town and the central city in 2013, many public houses were available for applicants in 24 townships in the city in 2014.

4.3.3.3 Encouraging Enterprises to Make Talents Stay in Zhongshan

After 24 years of careful operation, the "Zhongshan Talent Festival" was successfully held in March 28, 2014 creating a platform for attracting investment and recruiting talents to keep a good environment for talents' to stay in Zhongshan city. Many strategies have been adopted as follows:

(1) to build enterprise culture. In recent years, the towns have held enterprise culture festivals at different levels to encourage talents to stay here in Zhongshan. For example, some enterprises have launched their own culture magazines, such as "Perfect World", "Vatti World", "Evergreen", "Extra People" and so on. Some enterprises have created their own unique cultural characteristics in various ways. Royal Family Costume Co. Ltd, the South

China Handbag Co. Ltd and other enterprises use "The Three-Character Classic", "Di Zi Gui or Standards for Being a Good Student" and other Confucian cultures to guide employees; the Choi Heong Yuen, the Fourseas Furniture use the "home" culture to unite people; Topstrong sets up culture of caring for others by "Topstrong, let you rest assured!", while Guangdong Xingda Hongye Electronic Co., Ltd creates "happy" culture by the saying of "good mood has good things".

(2) Holding humanistic care activities. Every two years the city holds a meeting to commend enterprises with harmonious labor relations and excellent employers. Some enterprises hold activities of "caring for employees and serving talents". Precision Shoes Factory in Shanxiang Town holds "Great Love" summer camp training for the children of high skilled talents by introducing professional volunteers which is welcomed by employees sincerely.

(3) the flexible incentives and rewards. According to the statistics, 26% of the enterprises' income distribution system offers preferential policies to the front-line high skilled talents by the implementation of the highly skilled personnel allowance system. Zhongshan Public Transport Group Co., Ltd. encourages employees to improve their professional skills and ethics by holding the "ten best staff" activities. In Guangdong Changhong Electronic Co., Ltd technicians are treated the same as doctoral graduates with 800 RMB each month, and skilled talents with senior professional titles enjoy a monthly subsidy of 1500 RMB.

Recognition is a critical dimension in endeavoring to fix behaviors and, corresponding to the principle of recognition, findings showed that highly skilled workers value organizational culture of well-being and incentives to recognize their positive contribute to enterprise competitiveness.

4.3.4 Prominent Role of Highly Skilled Talents in the Industrial Development

The role of highly skilled talents is more and more obvious in the industrial development. Since presently manufacturing enterprises remain predominant in Zhongshan industries the transformation and upgrading of enterprises still depend on managerial and technical talents

especially huge amounts of high skilled talents. ZRP Printing and Packaging Group Co., LTD. in the Torch Development Zone in Zhongshan introduced a mechanic from Shenzhen in 2012, called Wu Junmei who was just a high school graduate but was very proficient in the paper printing design. So, a new production line was soon established by Wu after her introduction which creates an output value of about 30 million RMB per year for the company. Xiong Ligui, a project manager of the TCL air conditioner company, has an invention patent and a utility model patent and his many products have won the scientific research findings of provinces and cities which create output value of more than 50 million RMB each year. Lin Guoquan of Huaxing Plastic Machinery Co., Ltd., 60 years old who dropped off from junior middle school has worked for 14 years in the enterprise. Although he is a technical engineer with no certificates and qualifications, he has made 25 technical innovations for Huaxing which doubled the production efficiency and he is rated as an outstanding employee in the Gu Town of Zhongshan.

The huge role of highly skilled talents in enterprises can be seen from their paid wages. In Zhongshan enterprises, there has been a phenomenon of higher salary for blue collar workers than white collar workers. For example, the salary of a senior worker of Broad-Ocean Co., Ltd is about 40% higher than that of a general college graduate. A lot of business owners say that it may not be a big loss if a college graduate leaves since there are so many college graduates available in China while it will be a great pity if a high skilled worker drops off as the saying goes among people, “A high skilled person can hold up a blue sky.”

In the same line of reasoning that the previous finding, skilled workers earn recognition from enterprises as critical players for company competitiveness which matches the principle of recognition.

4.4 Problems and Causes in the Construction of Highly Skilled Talents in Zhongshan

4.4.1 The Unreasonable Structure of High Skilled Personnel

4.4.1.1 Inadequate Amounts

There is an average of less than 10 highly skilled personnel for each enterprise (Table 4-1), which is far from sufficient for an enterprise to develop if high skilled workers are in a severe shortage.

This value is considered very insufficient by enterprises because when asked about how many highly skilled workers would satisfy employers' expectations, more than two thirds (68%) identified a number above 8.7 of such employees (Figure 4-12).

Table1 High skilled talents at different levels

	Senior mechanics	technicians	Senior technicians	Totals
Talents at different levels	18 495	7 850	3 450	29 795
Average (per company)	6	2.5	1.1	9.7

According to statistics, the total number of senior technicians of the whole city is only 412 which is far from the needed number of 57 925. It is also consistent with the problem reflected by the enterprises that there is an urgent need of technicians especially mechanics with special skills. Specifically, high voltage electricians, electronics, CNC, lathe workers, welders, fitter, machine repair, boiler workers, paper workers, packers and dyeing and so on are in urgent need in Zhongshan according to the survey conducted.

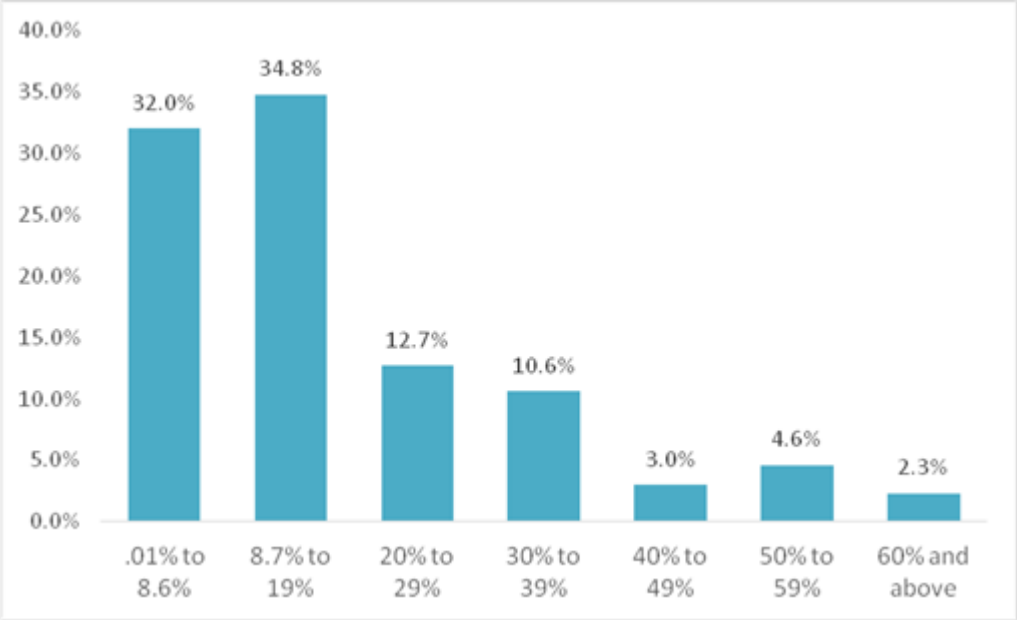


Figure 4-12 Satisfactory proportion of high skilled talents

This clearly shows that the priority given to high skilled development was not only necessary but urgent as the number of highly skilled talents per company is strongly stated by enterprises to be a constraint for company grow and competitiveness due to its insufficient number and structure.

4.4.1.2 Unreasonable Structure

(I) The unreasonable hierarchy structure

Highly skilled talents are unreasonably distributed according to professional titles as suggested by findings (Figure 4-13). Senior mechanics, technicians and senior technicians account for 21.6%, 9.2% and 4% of total skilled workers respectively, while intermediate workers and junior workers takes up 26.4% and 38.8%. Thus, the talent structure comprehends high-ranking talents in far less proportion than low side workers just as a triangle formation, which is taken as a constraint factor for the development of enterprises.

(II) Low educational level

Only 17.4% of the highly skilled talents surveyed graduated from colleges and universities, while 54.2% of the total talents graduate from special secondary schools or even illiterate.

(III) Unbalanced distribution

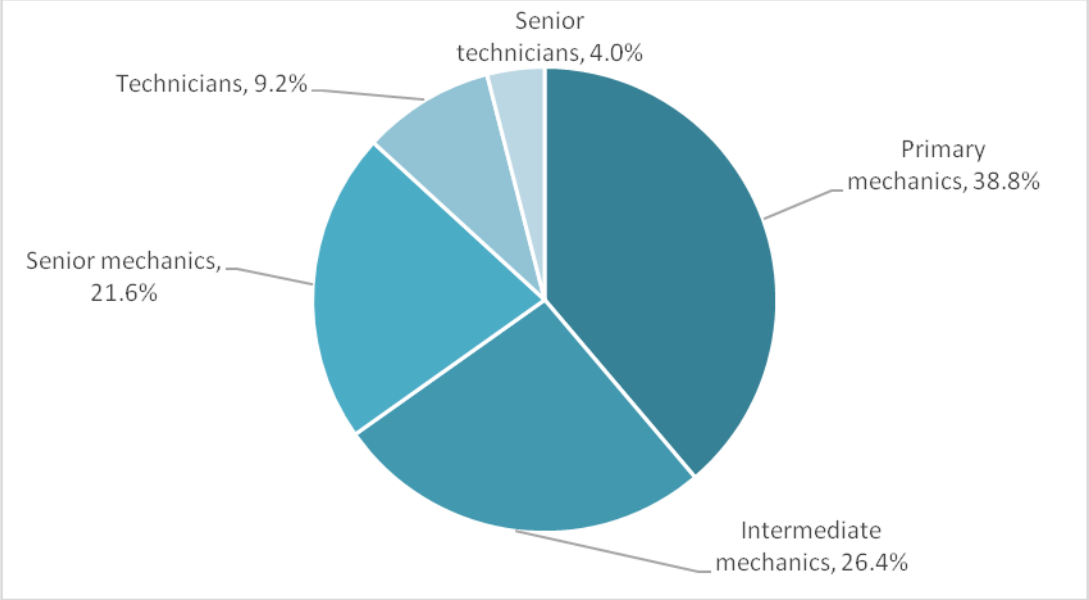


Figure 4-13 The proportion of skilled workers at different levels

In the survey of 3075 enterprises high skilled talents in the second and third industries are equally distributed, but they are unequally distributed in the specific industry. Findings show that professional posts in enterprises departments, government bodies and public institutions (which are relatively comfortable and relaxed) are much more than those in the front-line workshops and businesses. According to statistics, in recent years the top five types of high skilled talents who have registered in Zhongshan households are car maintenance workers, electricians, computer operators, human resource managers, and automobile drivers respectively. The least five types of positions are numerical control parts workers, clothing designers, logistics managers, printing workers, and electronic merchants respectively. The core positions including the fitter, the welder, the car worker and the mold worker, are less than 2% of all people entering the households, which indirectly reflects the uneven distribution of the high skilled personnel.

According to the current statistics high voltage electricians, electronics, CNC, lathe workers, welders, fitter, machine repair, boiler workers, paper workers, dyeing and finishing, and other ten categories are the most needed types of work. Many graduates also express their reluctance to work in front lines. This may cause severe shortage of skilled workers in the relatively hard work and poor environment.

4.4.1.3 The High Rate of Brain Drain

Another issue for Zhongshan's highly skilled talents is the crisis of brain drain. According to the statistics of job market more and more talents have been flowing to all part of China rather than Zhongshan city with rapid economic growth nationwide. The number of job seekers in Zhongshan has reduced by 10% in 2013 (from 2012), and 15% in 2014 (from 2013). Many enterprises reflect that special and top talents and operational technical talents are the most urgent needed workers. For example, TCL Air Conditioner Corporation has not recruited 3-5 top talents with the space structure and electric control research and development since four years ago. At the two symposiums of Zhongshan Polytechnic and the Zhongshan Torch Polytechnic the author found that the high skilled talents trained by local higher vocational colleges are also in a state of great mobility. After three years of skill training, most of the foreign students choose to go home and find another place rather than Zhongshan city. After graduation, a large part of them choose to visit other developed areas in the Pearl River Delta adjacent to Zhongshan, such as Guangzhou, Shenzhen, Dongguan, and Zhuhai. It is hard to retain high skilled personnel in Zhongshan and the high skilled personnel trained at home are eager to develop outside, all of which leads to the shortage of high skilled personnel in Zhongshan. At the same time the great mobility of highly skilled talents can be observed in many enterprises. Among the employees surveyed (Figure 4-14), 46.9% of talents changed their work two or three times, and 18.7% have changed their jobs for more than three time, while only 20.1% of them have changed once, and only 14.3% had not changed their jobs. This is evidence that employees' work is not stable.

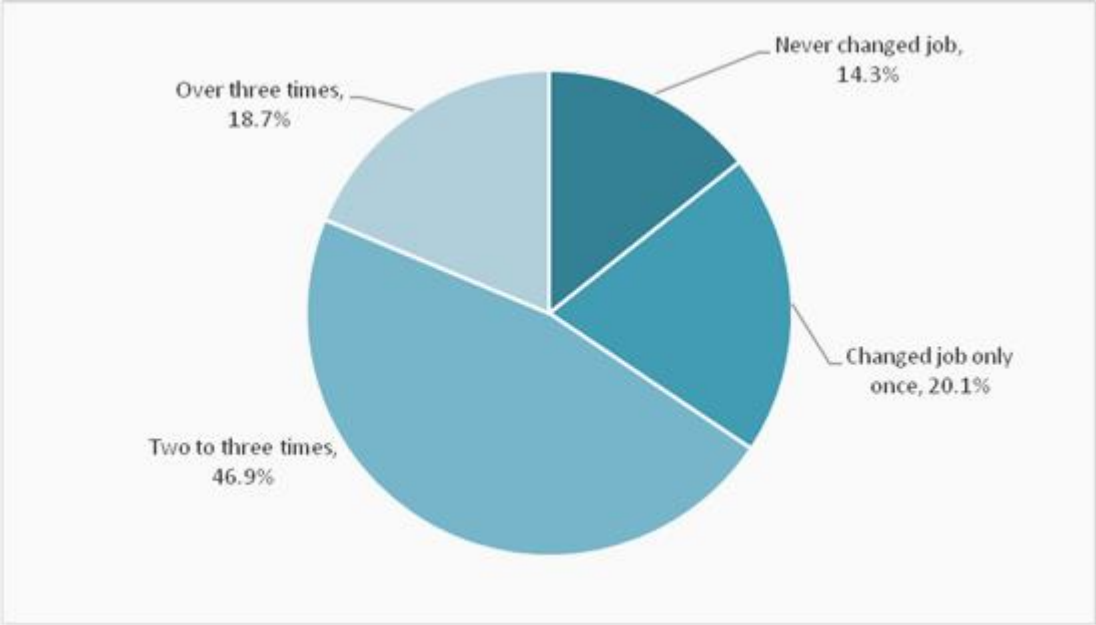


Figure 4-14 Times of changing jobs of high skilled talents

4.4.2 The Problems in the Construction of High Skilled Personnel Team

4.4.2.1The Existence of Traditional Ideological Concepts

(1) An outdated view of talent

As an old saying goes in China, "the worth of other pursuits is small, the study of books excels them all" most people at present still believe that college graduates can be called talents while those vocational school graduates have less merit. Also, it is common belief that who have diplomas and professional titles, or certificates, can be called talents even without great results and contributions made to society. The worst thing is that the skilled craftsmen who have no academic qualifications and professional titles but make great contributions and achievements are still seen as people of lesser importance. As a result, most parents do not consider the actual situation of their children and send their children to university. Even if the major and college education are not the youngsters' goal they are not willing to send their children to vocational schools, and they also do not want their children to be skilled workers in the future. This is also an important reason why so many high school students take part in college entrance examination with few chance of enrollment.

Findings suggest that China's traditional value of education puts emphasis on college studies and devalues vocational schools which creates an unfair notion of professional worth

and what is the value and status of a highly skilled professional. This negatively translate into the principle of recognition as social status is a normal motivation to make occupational choices.

(2) An outdated view of talents identification

Although the importance of skilled personnel has been stressed from various aspects, many managers do not truly regard high skilled personnel as real talents, but as ordinary workers and "production tools". Even if some managers are aware of the important role of skilled personnel in the development of enterprises, there are not many measures carried out to raise their wages and benefits according to their practical operational skills. So, they are still regarded as common workers among common people without higher status and respect. It is a reality that in a considerable number of enterprises the atmosphere of giving respect to highly skilled personnel has not really formed which truly reduces the highly skilled talents enthusiasm of improving their own skills.

(3) The incorrect occupational concept

Most graduates from vocational college choose jobs that do not match their own major. So, many graduates prefer to sit in the office or go to governmental departments rather than work in factories or front-line positions. A recent network survey shows that the proportion of people willing to engage in technical labor is only 10.6%, and only 9% of people believe that the technical workers are more capable of realizing their own value, and only 7% of surveyed people choose to work as skilled workers when given three options of civil servants, skilled workers, and businessmen. According to interviews with employees and students who have just graduated from schools, many workers are not willing to engage in front-line work because they think that doing technical work is a shame for their parents and relatives.

4.4.2.2 Unreasonable Education and Training System

(1) Unreasonable talent development structure

As for the talent development structure, general educated talents are far more than vocational talents. For the past three years students entering colleges and universities through college entrance examination in Zhongshan were 47 900 (accounting for 95.27% of the total

number of students) while those entering higher vocational and vocational schools was 21 400 and 39 700 (which together accounts for 61.7% of the total number of students). However, it is another case in developed countries (Hoffman, 2011), especially in Germany 75% of the students take vocational education but only 25% of the students take the undergraduate education which forms an olive type of education structure; In Singapore the proportion of students in vocational education is up to 70%. In China the dumbbell structure appears as the proportion of people receiving higher education increase significantly, while skilled talents become fewer and fewer.

(2) Unreasonable specialty setting

To some extent, there is a disjoint between vocational education and market demand in specialty setting. Due to inadequate market research the curriculum development of many higher vocational schools is divorced from the market demand. Some higher vocational colleges make curriculum plans suitable for teaching but unreasonable for students' future career. Courses and specialties are casually set up in some higher vocational colleges so many graduates cannot find suitable jobs while some needed specialties have no relevant courses. Therefore, it may make sense to set up specialties according to the requirements of technological diversification of enterprises, especially focus on setting up some traditional specialties such as carpentry, paint, sculpture, welding, architecture, ceramics, tea art and sewing with Chinese characteristics.

Still in the line of the principle of recognition this issue of social representations is important. Findings show there is a general unfavorable opinion about skilled workers as compared with college and university graduates. This favors misalignment between skills trained at school and competencies looked after in the job market. Additionally, because society values university teaching (that puts more emphasis on theory building and research), vocational schools may feel pressured to get closer to this model and fail their ultimate practice-focused training purpose/nature). The principle of relevancy is involved but so is the principle of recognition, that together represent a major opportunity for improvement.

(3) Unreasonable training modes

The training mechanism of school enterprise cooperation is imperfect, and there is a gap

between school education and enterprise training. The practices of school enterprise cooperation and combination of production with Learning in vocational colleges have not stepped up on a normal and deep integration development track. Most of them only stay at the level of teaching practice without establishment of a mutually beneficial "win-win" mechanism and an effective mode of co-education. One can infer that higher vocational colleges may benefit from being more cooperative in many aspects such as enrollment, teaching, practice, employment and other links to make a thorough cultivation road.

(4) The low quality of talents education

There are many problems in the quality of training. On the one hand, enterprises express their urgent needs of high skilled talents, on the other hand, graduates from vocational schools are not highly recognized by society, and cannot really adapt to market demand. A human resource director stated, "It is difficult for private and small and medium enterprises to recruit workers, especially technical operators, and some posts are still unmanned, such as welders, CNC machine operators and other key technical posts, although some monthly wages are nearly 10000 yuan, but the enterprises cannot recruit the appropriate personnel. One of the important reasons is that the vocational colleges pay more attention to theoretical knowledge rather than practical skills. Meanwhile the students' practical skills are neither strong nor are their professional spirit enough."

4.4.2.3 The High Mobility and Low Retention of Talents

As shown, the level of job mobility (especially with an outbound movement) is considerably high within highly skilled talents in Zhongshan with many vacant position unmanned due to labor shortage. Additionally, there were difficulties reported concerning attracting new talents to the city. Many enterprises stated that special and top talents and operational technical talents are the most urgent needed workers. Adding to the examples provided earlier in this thesis, Tai Peng Electrical Surface Treatment Co., Ltd reflects that it is hard to recruit talents since many of them come in the morning but leave away in the afternoon.

Analysis of brain drain in recent years uncovers the reasons that reside mainly in three aspects: (1) low salaries. Compared with the similar enterprises in Yangtze River Delta,

Zhongshan enterprises have a monthly salary of 1000 RMB, which has no advantage. A famous machine repair supervisor of Li Xing Qiang Gas Co.,Ltd has a salary of 8000 RMB a month for over 6 years. In 2012, he was employed as the technical director by Fukuhara's branch with a monthly salary of more than five million RMB. According to some enterprises in Huangpu since remote geographical environment and low wages, some new employees came in for only one or two days and few may stay for too long. (2) the attraction of the hometown is increasing. Some enterprises reflect that in recent years, over 50% of the old employees quit their jobs. They think that their hometown is developing well with many job opportunities and low cost of living. It is also convenient for their children's education and supporting their parents. The manager of Sound Electric Co., Ltd said that although the treatment of enterprise has been raised up, the brain drain has not ceased. Some employees worked for seven or eight years and became the backbone of the company but leave away when their children grew up and needed to go to school. (3) Low industrial level. A considerable number of small and medium-sized enterprises, labor intensive enterprises are reluctant to upgrade and develop their company structure, so even if they improve treatment and humanistic care for talents but when the talents grow up as high skilled talent they go home as soon as possible.

Figure 4-15 shows that the surveyed employees believe that individual development opportunity and high salaries and benefits are important factors for them to change jobs. The percentage of individual development opportunity accounted for 36.4%, 31.2%, and 10.6% of the first, second and third factors of job change respectively while high salaries and benefits account for 36%, 32.7%, and 22.5% respectively. Satisfying staff's salary and individual development opportunities are two important strategies for retaining talents.

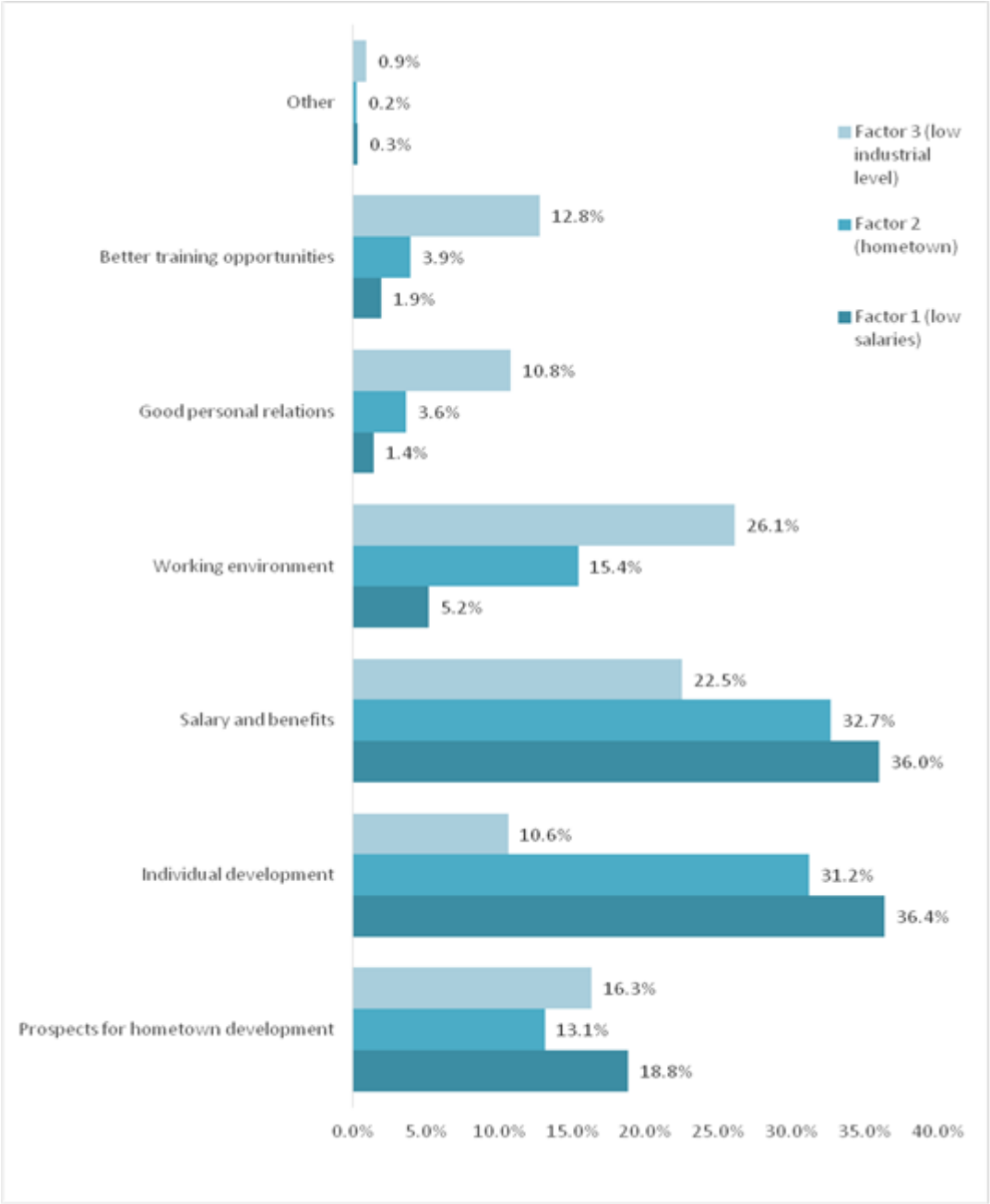


Figure 4-15 Factors affecting job change of employee in the enterprises

The principle of facilitation is implied in this issue although it also relates with the principle of urgency. The rising average economies in several provinces and cities build attractors that create an outflux of more employable skilled workers away from Zhongshan due to better salary level and development opportunities. This negatively impacts the capability to both attract and retain.

4.4.2.4 The Imperfection of Skills Training

(1) Insufficient attention paid to the training by enterprises

As shown, of the 3075 enterprises surveyed, 28.8% report having no training plan for employees. Adding to this only about one third (34.9%) surveyed employees are satisfied with the enterprises training (Figure 4-16). Slightly more than half respondents (51.9%) characterize it as being “not bad”, 10.7% are not satisfied, and 2.5% are very unsatisfied.

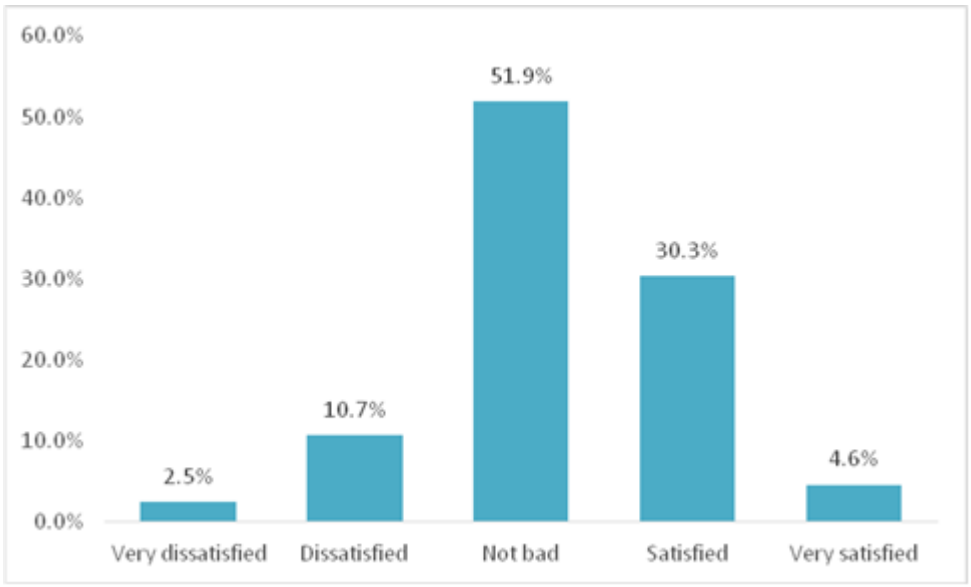


Figure 4-16 Degree of satisfaction with skills training provided by the enterprises

Findings suggest that a considerable number of enterprises do not attach much importance to skills training for employees or are not being able to satisfy employees expectations / needs. According to information collected, it is generally believed that enterprises usually pay more attention to economic benefits than employees’ development due to two reasons: First, many enterprises especially labor-intensive enterprises lack the long-term development vision for cultivating talents. They still want to rely on the population dividend to support economic growth rather than the promotion of labor skills which is a driving force for enterprises’ great progress. Ultimately, they use talents but do not train them. Secondly, the cost of talents training is high. It will cost a lot of manpower, material and financial resources for enterprises to train a high skilled talent. For many enterprises it may not be worth the effort to train talents for a long time at huge amounts of cost in a time of fierce industrial competition and high rate of brain drain. Powerful enterprises are more

willing to pay high salaries for hiring talents from other companies.

Findings show that with a history of strong growth, enterprises built harsh competitive environment and press towards focusing on low human capital cost. This compromises the principle of recognition because rewards are very much taken into consideration by workers, especially those that are dislocated or feel they loose much by remaining where they are.

(2) The lack of training motivation among the employees

Surprisingly, among the surveyed enterprises, 23% of employees stated they did not plan to improve their skills. Many of them are not confident in skill promotion and future career plan because of their own poor educational background. Another inference focuses on possible explanation for this finding: they may have not enough time to combine work with study because of their high work pressure in front line. Meanwhile most of enterprises in Zhongshan city are in remote areas around townships where there are few training schools available for workers to choose.

(3) Low level of the training teachers

The survey suggested that there are not enough social training institutions for business development. Additionally. there are many aspects that should be considered: (1) Unsuitable profile of teachers. Teachers of the social training institutions are usually graduates from secondary schools and colleges and almost have no qualified skills. Few of them are senior mechanics, the technicians and senior technicians. For example, in Yi Jin Vocational School in Zhongshan city, of 52 teachers in all there are only 12 senior mechanics and 12 teachers with double qualifications, only 23% of the total number. (2) Low level of training. The levels of training schools are mostly primary and intermediate with few higher levels of training courses such as the training of technicians and senior technicians. In 2014 there were 11 581 social training institutions at primary and intermediate levels, accounting for over 60% of the total institutions. (3) the limited training for manufacture. 38.4% of training courses are concentrated in the service industry such as electricians, housekeepers and cookers with a relatively lack of professional training in manufacturing and new industries.

(4) The imperfect test of the national vocational skill qualification

(1) Identification exam contents are not closely related to the actual needs of enterprises.

Some test databases and training equipment lag far behind the actual needs of production and technology in enterprises. For example, e-business teachers are required to train students to learn to use computer and network technology to engage in all kinds of business activities or related work between businesses and customers. However, the skills of opening Taobao stores and the business operation cannot be trained adequately through limited e-commerce training courses nationwide. (2) Many industrial types of work with Zhongshan characteristics have not been included in the range of national types of work, such as lighting, clothing industry, shoe industry, shoe design, and red wood furniture making which affect the training of skilled personnel

4.4.2.5 The problems of talent evaluation

(1) Imperfect evaluation system of skilled personnel

The questionnaire data shows that only 31.4% of the enterprises have set up the standard skills evaluation and salary system according to talents' practical skills. Some workers have not received corresponding recognition even though they have acquired high levels of skills after many years of great efforts in enterprises. As for the "level" and the treatment they have no difference from new employees, which affects the enthusiasm of the staff to improve their skills.

(2) Double evaluation of enterprises and government

There are two different kinds of evaluation system made by enterprises and governments at present. Evaluation made by government is a five-level system, while enterprise evaluation is an autonomous system (such as nine level evaluation system). The dual evaluation systems lead to harmful effects on high skilled talents. First, many enterprises give employees promotion and salary in accordance with talents' actual working ability and performance without consideration of certificates they got. Many higher vocational graduates who have obtained advanced skills certificates at school cannot get recognition from employers. Second, the rewards and preferential policies of government are mainly based on its own evaluation system, which mainly depends on certificates of different degrees without consideration of the actual performance in enterprises so many skilled craftsmen are unable to obtain the corresponding benefits from government for their poor educational background. The talents

who have vocational qualification certificates cannot enjoy the government related preferential policies. As is shown in Figure 4-17, highly skilled talents recognized by enterprises are much more than that those having certificates of senior mechanic or above certificates. The two different types of evaluation are truly unfavorable for the development of enterprises and talents. Effective measures should be taken to create a reasonable evaluation system. For example, the specific elements for the evaluation of high skilled personnel should be taken into account, such as personal quality (education, title, etc.), personal results (patents, inventions, honors, etc.) and work performance.

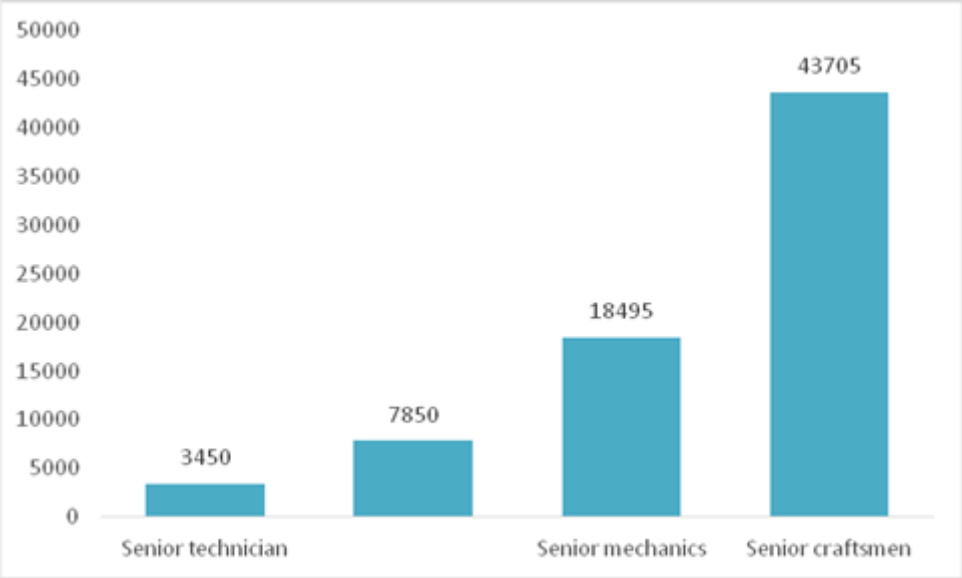


Figure 4-17 High skilled talent distribution map

4.4.2.6 Incentives Undervalued

Judging from information collected and aggregated we identified policy and practices regarding incentives as a factor explaining system under performance regarding highly skilled talents.

(I) At government level

(1) Lack of policy incentives. According with most opinion, there are still not enough incentives adopted to encourage high skilled talents in breadth and depth. High - level talents with high diplomas, degrees, and rich work experience in big businesses are more competitive that high skilled talents with practical experience and special skills so skilled talents cannot

get enough incentives to develop on their own.

(2) Not enough rewards. Compared to Zhongshan city, Suzhou, Dongguan, and other places select several outstanding high skilled personnel every year to give different amounts of government allowance to raise the status of high skilled talents.

(3) Not enough services. The vast amounts of highly skilled talents need more realistic demands except for household registration and children's school admission. In Inse Kitchens Group the number of high skilled personnel who wants to register household in Zhongshan is much higher than the designated quota and it needs huge amounts of documents and materials to apply for children's enrollment wasting a lot of time and efforts. TCL air conditioning enterprises believed that the quota of household registration and the integral enrolment can only meet 40% of talents' demand.

(II) At enterprise level

According to the survey data, 32.1% of the high skilled personnel think that their own working motivation is insufficient, 22.2% think that the room for development is limited, and 16% feel lack of innovation in their own work. The ultimate cause seems to be the lack or simplified incentives by enterprises. At present, most enterprises give material incentives including wages and funds according to relevant rules and regulations with no intangible (psychological) incentives which could create more work motivation. Or some others stimulate the enthusiasm of talents with no sincerity, which makes it more difficult to produce a real sustained and effective incentive effect.

4.4.3 Causal analysis of the problems of the construction of high skill worker

As it has discussed above, there are many problems for the construction of high skilled personnel in Zhongshan such as great population shortage, unreasonable structure, low educational level, high brain drain, difficult training of skilled talents. They may be caused by Zhongshan's location in the Pearl River Delta where people stick to their own traditions and customs reluctant to accept new ideas, for example, most people speak Canton rather than Mandarin. Besides there are also social reasons such as social system, talent management, economic market development, corporate governance mechanism, training inefficiency and

business and working environments.

4.4.3.1 Social System

People's prejudice against high skilled talents is an important reason for the shortage of skilled talents. The outdated talent view dates to the period of China’s feudal times when people believed that there was a huge social gap between the mental workers (shite collars) and the manual labors (blue collars). This negative social representation of talent still dominates the education, recognition and utilization of talents today. In society the evaluation of talent tends to emphasize education degree but neglects operational skills. Insufficient education and training costs and low salaries are also important reasons for the shortage of skilled personnel. This makes many skilled talents fail to attain the social status and respect they aspire to. Some people's understanding of highly skilled talents still stays in the initial stage of small-scale agriculture or industrialization. The high skilled talents are still regarded as "agricultural skill", "craftsmen", or "workers" at the industrial age.

If the outdated talent view still permeates all levels of society, it will inevitably affect the development of highly skilled talents. In Germany there is the cultural tradition of attaching importance to the "skill". The national law gives the same status to the vocational education and the general education, and the vocational education is included in compulsory education as an important part of it. The government takes responsibility of developing attractive vocational education through the formulation of policy measures to enhance vocational education and ensure that vocational schools can self-govern, and the trainees have the possibility of promotion. Generally skilled workers have high salaries and it is a proudest thing to be a technology master in vocational colleges, having same status as white collar workers. Only 20% of Germany's school-age youth go to college, and 80% of them receive vocational education after middle school graduation. Similarly, in Japan skilled talents are also respected for their outstanding contributions to society. Some of them are awarded the prize of "national treasure" by the government. In South Korea skilled talents may enjoy material and spiritual double rewards if they win skills contest, and even may be treated as state guests.

4.4.3.2 The talent Management System

The system of talent management is not appropriate since workers and cadres are strictly differently treated in the personnel management system established during the planned economy period. This means cadres with high level of status are taken as talents while most skilled talents are taken as ordinary labors. So most skilled talents usually are considered as common people in society but technologists and engineers from technical manpower structure are true talents. Graduates from universities (including junior college graduates) are regarded as national cadres so they are managed by the personnel department. High skilled talents are considered ordinary workers, so they belong to ordinary labors.

The evaluation system of high skilled personnel is imperfect because socialization of production professional skill identification is still at a very low level and the coverage of vocational qualification certificate is low; the evaluation methods of high skilled personnel by combining production, innovation and individualization of enterprises are not perfect.

Because of the difference between the national professional standards and the operating regulations of the imported equipment, the foreign invested enterprises are difficult to identify the national professional standards. The development of industry standards and item bank lag behind the development of new technology, equipment, materials and arts. There is no evaluation system for highly skilled talents. Some companies like Small Vatti Co.,Ltd and Sole Motor Co.,Ltd have their own technology evaluation system, but most of them have not yet such evaluation. Even some industrial clusters and trade associations do not have their own evaluation system which limits the emergence of highly skilled talents. Employees' skill level certification and salary benefits are not linked. The enterprises do not pay the salary and give the corresponding reward to the employees who obtain the qualification certification in time. This hurts the enthusiasm of the employees' research and skills promotion, and then influences the development of the industry and the enterprise.

The government's talent incentive mechanism is not sound enough. The top-level policy design is not perfect acting as an obstacle to the training and development of highly skilled talents. It is mainly manifested in three aspects: basic training, on-site application, and result evaluation of highly skilled talents. In the system, the high skilled personnel of the enterprises

have not been brought into the high-level talents of municipal government which removes them from incentive system. Many types of work have not been included in the national range of work, such as the installation and maintenance of elevators, the machine repair in the garment industry, the design of the shoe industry and the mahogany furniture. However, these are central in Zhongshan productive structure. At present, the policy is inclined to talents who have diplomas and work experience but ignores skilled craftsmen who have practical experience but are difficult to assess with special skills. Many young talents fail to develop their talents.

4.4.3.3 Economic Market Development

Market regulation and allocation failure is the root cause of the shortage of skilled talents. At present, a series of problems exist in the process of training high skilled personnel in China especially the imbalance of the coordination mechanism of interests among the various subjects under the market economy system. Therefore, the arrangement and coordination of its interest mechanism is an important part to ensure the successful cultivation of highly skilled talents. The vacancy ratio of highly skilled talents is significantly greater than that of general skilled talents, which reflects the structural contradiction of training skilled talents in China. Generally speaking, the transformation of skilled talents to high skilled personnel is a long-term and persistent process. It emphasizes the improvement of the overall operation system of high skilled personnel training and needs to be invested in a long term. Market regulation failure, do not optimized allocation and application of human resources are the primary factors of imbalance between supply and demand in labor market (Zeng, 2004). The imperfect talent market mechanism has result in the liquidity of market, the flexibility of price, the sensitivity of the reaction, the effectiveness of the regulation, all of which are not in accordance with the requirements of the market economy.

In addition, although the labor market in China has been formed at a large scale, but it is still difficult to realize the free flow of labor resources under the effect of price mechanism, which seriously restricts the development of the market.

Market oriented labor management strategy makes it difficult for migrant workers who have no skills to accumulate skills in their careers. Under such market economy system,

enterprises participating in free competition should get enough skills through the highly mobile labor market. However, excessive competition squeezes the profit margins of enterprises, worsening the employment environment of enterprises, and making enterprises only able to offer unattractive posts. The result is that on the one hand, enterprises face recruitment difficulties, on the other hand, enterprises and migrant workers are unable to participate in the skill investment so they can only nurture a low level of skills development.

4.4.3.4 Corporate Governance Mechanism

Corporate governance mechanism and skills shortage are the main reasons for the lack of motivation for skilled talents to accumulate skills.

Many small and medium sized enterprises of Zhongshan such as Homa refrigerator, Camry weighing apparatus, Changhong electric appliance and industries of lighting and red wood adopt a large-scale standardized production system to save costs as their main competitive advantages. The result of low competition is to reduce the proportion of labor force in the profit distribution, but employees' salaries are hard to increase. The enterprises do not adopt the wage system according to the skills and are not willing to provide long-term jobs but reduce the complexity of the job to subdivide the work as far as possible to keep the staff replaceable. They provide social security for the employees at the low level, but regional restrictions and social security payments do not attract employees.

Under competition pressure due to low cost the market-based labor management method adopted by the manufacturing enterprises is not conducive to the skills accumulation. On the one hand, these practices reduce the employees' work safety; on the other hand, they also reduce their salary safety. In the absence of labor safety, migrant workers will not invest in the training of professional skills or industry expertise. Specifically, first, low salaries and benefits reduce the incentive of migrant workers to work for a single enterprise for a long time, leading to frequent job hopping, which is not conducive to the accumulation of specific skills industries and enterprises require. Secondly, to avoid the non-fixed term labor contract, the enterprise is not inclined to provide long-term labor contract which makes enterprise do not want to provide skills training for the employees. Thirdly, low differential wages whether skill based differential or work experience wages are not conducive to employee participation

in skill training. Fourthly, in order to improve the substitutability of employees and prevent the loss of skill caused by the flow of employees, the job is subdivided as detailed as possible, and less work rotation is used, which reduces the attractiveness of the job to the staff, on the other hand the employees cannot improve the individual skill level even after a long term work in the enterprise.

Enterprises do not fully establish incentive mechanism for income distribution. The cost and revenue of training high skilled talents are asymmetric. Such business vision, production and business benefits directly affect the training of skilled personnel. Salary and benefits and practical skills are not linked and incentive measures to connect skills level and salary incentives are not effective. Some highly skilled personnel said they are not active to take part in training skills since promotion and subsidies are impossible. At the same time, a strong atmosphere of skills competition has not been formed in society and internal enterprises. These reasons lead to the insufficiently exertion of the role of highly skilled in large groups, which has also affected the rapid development of enterprises. A high skilled talent in Taipeng Electronic Plating (Zhongshan) Co., Ltd said that the employers can't afford to spend money to cultivate talents and do not pay attention to the national skill certificates and there is no difference even when I have many certificates such as human resources consultant, enterprise trainer, and labor relations coordinator.

Therefore, the growth of high skilled personnel does not adapt to the requirements of the development of contemporary science. The growth rate of high skilled personnel cannot meet social demand. It causes many problems such as the shortage of students in vocational colleges, the worrying situation of brain drain, and the relatively lack of skilled personnel, etc.

4.4.3.5 Training Inefficiency

Few types of occupations for training are available. At present of more than 2000 types of occupations in total available for training across the whole country only 38 types of occupations are trained in Zhongshan and insufficient students choose to be trained because some training courses are unlinked to enterprises practical working.

The content of training is outdated. Some training test databases, training equipment have lagged the actual needs of enterprise production, some of which are far from the level of

production technology. Enterprises believe that training for workers is unimportant and so many enterprises are not active in talents training.

The training institutions are still relatively simplistic and unsystematic. Most training institutions are unsystematic social training institutions which may benefit from being guided by the higher vocational and technical colleges, enterprises and industry associations. The training contents usually belong to the service industry with few productive fields and industries. The unreasonable top design has caused a waste of some social public resources. Meanwhile employees have many practical difficulties in taking part in training, such as poor educational background, time and space limits and family inconvenience. All these problems restrict the realization of the maximization of training efficiency. The curriculum system of vocational education also has many problems such as unreasonable structure and content, outdated teaching methods and contents, skill-oriented vocational education without broadened knowledge and the existing backward vocational education system.

The low training quality. The teachers of general higher education colleges have rich theoretical knowledge but weak practical operation skills in enterprises. In contrast, the teachers of vocational and technical schools have operational skills but weak theoretical knowledge. The lecturers in enterprise have strong practical skills but weak in teaching methods. So, it is difficult for enterprises to achieve the ultimate goal of "high theory, good technology, strong practice and good explanation". Therefore, trained talents cannot meet the needs of business development

4.4.3.6 Business and Working Environments

(1) The inferior development environment of highly skilled personnel

Talent environment refers to the sum of all external conditions for the growth and development of talents. Marx believes that "environment may also create human" (PPH, 1991). The growth and development of any talented person in the world is inseparable from his or her environment. Suitable environment can motivate and promote the growth and development of talents. Unsuitable environment can restrict and impede the growth and development of talents. According to Sotech Electric Co., Ltd despite the straight rise of salary the loss of talent has not stopped for recent years as the loss rate reaches 5-10% and

some old staff who have worked for seven or eight years left away when their children reached the age of school admission. Some enterprises in Huangpu town said that because of the poor geographical environment and low wages, some new employees stayed there for only one or two days. Zhongshan Conon Co., Ltd reflects that its management personnel fly here from Shanghai and other places without home here in Zhongshan.

(2) Barriers to entry into the households in Zhongshan

According to the existing policy, off-staff workers including public servants, employees, and contract workers in the institutions and companies have no chance to register local households in China. Some townships deliberately make high skilled talents unable to register households. For example, in Xiaolan Town if applicants for household registration violate the family planning policy she/he will have no chance to work there. Some neighborhood committees in East Street and the Torch Development Zone require applicants to submit the application materials again and again without final results all the way.

(3) Difficulty of talents' children in entering local schools

At present, the quota of children's enrollment in Zhongshan does not meet the actual demand of high skilled talents. In the Torch Development Area and Nantou Town, the quota of primary school enrollment is 570 but the applicants are more than 900. The quota of the first grade of the primary school in Nantou town is 200, but the number of applicants is more than 330. Changhong Air Conditioning Co., Ltd reflects that this year applicants for school admission are 11 employees who have worked there for more than five years and if their children cannot go to school in time, they may resign and go home. TCL air conditioning enterprises believe that households, children's schooling and housing can only meet the needs of less than 40% of applicants as stated. The textile clothing company's master Hu Zhong of 36 years old who is very fond of the textile industry has made deep research on the Fuyuan textile machine and has been recognized by the Japanese experts and appreciated by the manager of the enterprise. But finally, he left away and was recruited by a Shanghai enterprise since he has no Hukou in Zhongshan. Some highly skilled personnel from Shenzhen, Guangzhou and Zhuhai reflect that they would like to work here in Zhongshan for its good environment and low house prices. They desperately hope the government may take some

measures to make their children to enter the school in time since education is more important than job opportunities.

(4) The inadequate service facilities

Due to few communicating platform available for talents to exchange mutual ideas and learn from each other, it is hard for talents to improve their own technological capabilities. Mr. Li, the manager of Dong Cheng Furniture Co., Ltd believes that college graduates may consider many factors such as corporate culture, team building, salary and welfare, and development environment when looking for a job. Some enterprises located in remote villages and towns reflect that because of the lack of necessary supporting facilities around the enterprises such as medical, food, housing, practice and learning, it is difficult to recruit high skilled personnel with that profle. Sotech Appliances Co., Ltd reflects that if the problems of the household, housing, schooling, wages, pension and medical security are not solved, talents will not stay there for long. In addition, in Zhongshan, there is no unified, large-scale talent market but Shenzhen, Guangzhou, Dongguan have all bigger perfect markets. Ultimately, enterprises in Zhongshan spend money to recruit people in vain.

Overall, the results are focused on findings concerning how extensively are possible variables involved in depicting and explaining current high skilled management situation in Zhongshan. All this part of the research could be seen as the designing empirically sustained on the shared causal schemata.

Chapter 5: Conclusion: Proposing an Integrated Model And Recommendations

Conclusion pertains focusing on what comes out of results. In this sort of thesis we believe it is appropriate to split the conclusion in two sections: the first one that integrates all findings into a single explanative model, and a second one with the recommendations that emerge from all these findings.

So, causes that emerged from open answers by all stakeholders inquired are multiple, as expected. They pertain system level causes (namely at the public policy and market dynamics level that mirror a negative social representation of vocational training and skills acquired (seen as of lesser merit than college or university level). They also pertain organizational level causes (namely at the formal educational system that, according to general opinion, do not fully meet the requirements of the productive system, but also at corporate level where enterprises that do not sufficiently invest in development, and do not incentivize or recognize the important status of highly skilled talents). Lastly, factors also pertain individual level where highly skilled talents do seem to believe there will not be due recognition and opt to move out quickly.

5.1 Building A Model of High Skill Workers Management for Zhongshan

Considering the full range of data gathered, we believe to have enough information to propose an explanative model of the structure and dynamics of highly skilled personnel management in Zhongshan. Structurally, we should keep in mind the same two dimensions used when building the descriptive model (stakeholders and Strategic HR functions Ability-Motivation-Opportunity).

The full multilevel system should provide conditions to capacitate (initial training as in vocational schools or college), to deploy skilled individuals in suitable organizations (that use their skills, that develop their skills and reward accordingly by means of an attractive salary,

adequate and fair incentives, and generous benefits).

The mission of each stakeholder is distinct but acts in complementary ways. Workers have the initial mission of acquiring and keeping updated competencies that make them to create the highest value their potential allow them to. Enterprises have the mission of attracting, identifying, deploying (make use of competencies) such skilled workers, so to increase their competitiveness and adding value to their stakeholders. Governmental authorities have the mission of structuring a set of regulations to uphold social and economic harmony, providing guidelines and ensuring conditions for the well-being and prosperity of the people.

All these stakeholders interact to build the talent management system. From the dynamics point of view, we think that an effective macro level talent management system can be conceived as a triple circle. The first circle starts with the creation of a competence-based education system designed to train students until they become highly skilled (initial training, involving the individual – as a student - and the teaching organization). In a second phase, the system should also be able to deploy these job applicants in the market with a high employability profile (involving the teaching organization, the individual as a novice worker, and the governmental entities linked to job market), the job market should allow for the correct identification and recruitment of highly skilled workers and suitable enterprises that can use their potential to the fullest (involving the enterprises and the individual as job applicant).This ends the first circle.

The second circle concerns those workers that have the competencies and skills but do not have a certificate. The system should be able to identify such workers (enterprises and education organizations) and motivate them to formalize the recognition of their skills (via a formal process of evidence-based tests). This will allow for their formal status as qualified workers.

The third circle concerns all workers that want to keep their employability by updating their skills. Here the system should be able to institute routine self-checkups, build a culture of continuous learning and improvement and create learning opportunities both in the enterprise and in the education system.

In all circles, the education system should be conceived as a joint effort between schools and enterprises with the common denominator of sustaining a strong competence-based training.

In this way, both workers that went through formal certification as highly skilled as those who did not have that opportunity, can invested to further develop their skills, to be duly recognized for the importance of the contribute to the enterprise, and correctly evaluated and empowered (involving the enterprise as HRM decision maker, and the individual as skilled worker). Also, highly skilled workers should be given opportunities to advance in their career and experience self-realization so to remain and nurture a sense of organizational commitment. All circles should be organized around these principles as a realization of the guidelines set by the 13th Strategic 5-year Plan and we believe they have an overall dynamic as depicted in Figure 5-1.

The understanding of the entire system crossed with knowledge from foreign systems benchmarking guides our intention to go beyond mere description and explanation of the current situation. We think that it is our duty to propose a set of recommendations to foster the system effectiveness. With this spirit we will show what are, in our opinion, the recommendations that may be considered to improve the overall system and deal effectively with issues already identified.

5.2 Recommendations for Zhongshan

Since Zhongshan has entered a new historical period of economic development and the new normal, new challenges and new tasks are urgently demanding that Zhongshan seize the opportunity to speed up the pace of increasing high skilled personnel. The following specific measures are put forward according to our findings and critical analysis. This is, by definition, a prescriptive set of assertions that is intended to target the Zhongshan case and ultimately offer integrated view of a model to guide high skilled personnel management from a macro level point of view.



Figure 5-1 The three circle model of multilevel talent management system

The construction of highly skilled personnel should be guided by rules accordingly. Zhongshan should introduce the plans for further strengthening the construction of high skilled personnel as soon as possible, so as to make clear the guiding ideology, objectives, principles, priorities and responsibilities of the building of talents personnel, and strive to bring up a contingent of highly skilled personnel with adequate quantity, reasonable structure and exquisite craftsmanship to provide intellectual support and talent guarantee for the construction of a beautiful and harmonious Zhongshan city..

5.2.1 The Guiding Ideology And Main Tasks of the Planning.

To build a beautiful and harmonious Zhongshan and vigorously implement the strategy of "strengthening the city with talented people" authorities should build up the highly skilled personnel. Such system of a high skilled personnel development and management should consider Zhongshan characteristics with the focus on the training, evaluation, employment and motivation.

The policy measures such as "clear goal, innovation mechanism, deepening reform and optimizing environment" are the key points in the work of the construction of high skilled talents. The emphasis is to improve the vocational training system for all workers in theory and practice, and to form a new pattern of overall coordination of government, enterprise, school, society to promote the integral work of high skilled talents. The target task is to focus on the strategic goal of realizing the economic and social development of Zhongshan City, adapt to the requirements of building a modern new city, further update the concept, improve the policy, innovate the mechanism, optimize the environment, and increase the high skilled personnel team from the aspects of training, selection, evaluation, use, encouragement, communication and guarantee. Efforts should be made to build up a highly skilled workforce with a large scale, reasonable structure, exquisite skills and excellent style of work.

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5.2.3 The Basic Principles of Planning

(1) the principle of people-oriented

It is necessary to meet the needs of various workers in all fields and realize the sustainable development of people for the construction of high skilled talents to coordinate the construction of high skilled talents with economy, society and environment by exploring and exerting the potential abilities of people and maximizing the enthusiasm of the people.

(2) the principle of using enterprises as main body

Enterprises are the main stakeholder of the use, training and evaluation of high skilled personnel. Therefore, authorities should establish a modern enterprise training system, undertake the task of training high skilled personnel, participate in the whole process of cultivating and assessing the high skilled talents of enterprises, and give full play to the enthusiasm of the enterprises in the construction of high skilled personnel.

(3) the principle of competency standard

Skills training should be practically guided by market demand to meet the requirements

of enterprise production posts to achieve the goal of improving vocational ability and employment quality.

(4) the principle of lifelong learning

It means that the cultivation of highly skilled personnel must be conducted through the whole process of their professional work following the proverb of "never too old to learn".

(5) the principle of coordinating different aspects

The construction of highly skilled personnel is an extremely complex systematic project involving many aspects. At present, the main elements of the construction of high skilled talents are the government, enterprises and vocational colleges. The government mainly plays the guiding and promoting role by mainly focusing on the policy planning, funding, system protection and environment construction for skilled talents. The main role of the enterprises is to cultivate and use highly skilled personnel by mainly focusing on the cultivation, use, encouragement and recognition of high skilled people. Vocational colleges and universities mainly focus on the education, training of high skilled personnel as a reserve force of talents transportation for enterprises. Government guidance, enterprise main body, school participation and social support can be combined and jointly promoted to truly form a good situation for the construction of high skilled personnel. It can be shown as Figure 5-2:

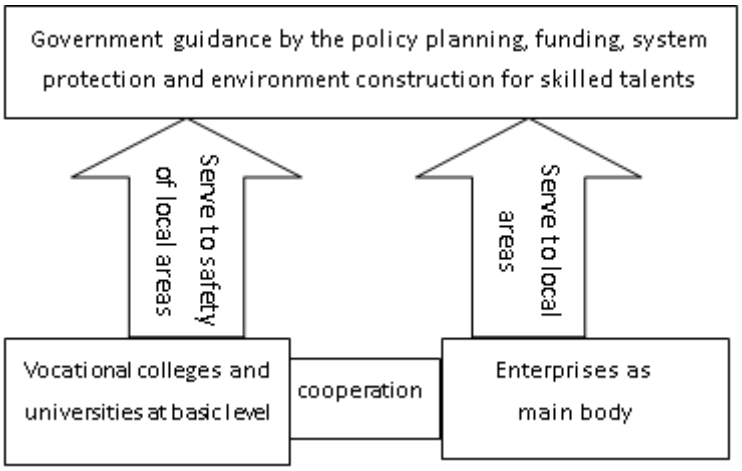


Figure 5-2 The cultivation of high skilled talents system

(6) the principle of legal protection

Authorities should gradually establish and improve laws and regulations for the

construction of highly skilled personnel, to make healthy development of highly skilled talents in the rule of law.

5.2.4 The Key Mechanisms for the Talents Construction

(1) The management mechanism

The construction of highly skilled personnel should be managed in a global way by the participation of concerned government departments, enterprises and colleges and universities. On the one hand, the government departments concerned, such as education, labor, personnel and social security, should jointly participate in the establishment of leading organizations such as a Steering Committee for the Construction of High Skilled Personnel as a guiding and promoting role. On the other hand, it also needs to promote cooperation between industrial enterprises, and vocational colleges and social organizations by various forms. A management institution such as school enterprise cooperation Steering Committee may be considered to enable it to play a role in enrollment, education and training, transportation and utilization, and continuing education of high skilled talents. The main responsibilities of the specialized management institutions set up by the enterprise and the school are to determine the objectives of the training of various types of high skilled personnel; the schools and enterprises jointly establish curriculums and implement teachers training to better serve to talents education. (Fei, 2000)

(2) the guarantee mechanism

First, it is necessary to setup scientific specialties and a curriculum system. The relevant experts and employers can be introduced to judge and recognize the rationality of the specialties and adjust accordingly in time to keep it updated. As for the curriculum system, the relevant personnel working in the related industries, enterprises, universities and education departments can be employed to work together to design syllabi and courses. Second, it might be necessary to build a "double-qualified teacher" faculty. The construction of "double-qualified teacher" faculty should adhere to the principle of "external introduction and internal training". It means that double-qualified teachers can come from external enterprises and integrate teaching staff by internal training. Third, the pattern of investment

can be diversified from different aspects since the cultivation of highly skilled talents involves various interest relations when it may involve a long investment time with uncertain output and high spillover. Accordingly, the government should change the single investment mode by widening the channels of investment and financing actively to promote the diversification of investing in the training of high skilled talents so that school-enterprise cooperation can be transformed from the low level of scattered distribution to the high level of a system. Meanwhile relevant laws should be made to ensure the stable cooperation between the various types of schools to promote the organic combination of investment bodies (Chen, 2004)

(3) the evaluation and incentive mechanism

The training effectiveness of highly skilled talents should be evaluated by both school and society. The school evaluation mainly includes examination and assessment with the acquisition of graduation certificates, professional qualification certificates and skill grade certificates as measurement standards. The social evaluation mainly comes from the feedback of the enterprise, including the overall evaluation of the trained personnel, the level of job competence, the performance of products and the workers' income and so on. In the process of training highly skilled talents, skills contests are encouraged to improve skills. Double-qualified teachers should be encouraged by various incentives such as post allowance and subsidies, title promotion, appraisal and approval, material and intangible rewards and so on to mobilize the enthusiasm of the teachers to participate in the construction of "Double-qualified Teachers" faculty.

(4) the legal mechanism

The training of highly skilled personnel should be raised to the legal level to clarify the obligations and responsibilities of the various subjects participating in the training of high skilled personnel by the establishment of different legal systems including a legal institution of professional certification, the system of employment access, and double certification system. The preferential policies should be given to vocational schools, enterprises and individual training institutions. The system of government investment in school enterprise cooperation should be constructed with the improvement of the supervision, guarantee and employment of cooperation.

5.2.5 The Path Models of High Skilled Personnel Construction

(1) Balanced developing path for high skilled talents training

The appropriate choice for high skilled talents training is higher vocational education. The developing path for high skilled talents training should be vertically high migrative and horizontally cooperative. At the vertical level, higher vocational education at the undergraduate and above levels needs to be established to make up a direct ascending channel for students to get through from junior college to postgraduate education. Authorities should set up higher vocational education in key universities, area-application-oriented institutes and excellent vocational colleges in diversified educational forms.

(2) the path of the integration of industry, education and research

It is necessary to attach great importance to enhancing creative ability of scientific research for high skilled talents when the level of vocational education is raised up (via integration of industry, education and research). The integration path aims to realize the win-win development of enterprises, learners and higher vocational colleges.

(3) the path of cultural integration between school and enterprise

The high vocational competence of high skilled talents mainly lies in the mind level of employees. So, culture education is the only way to improve the comprehensive level of the profession. The integration path of school enterprise culture can help both school and enterprise to realize their own values. Since enterprise and higher vocational education can be integrated it is feasible to build an integration path of school-enterprise culture. It is an effective way to develop school-enterprise culture by developing the network organization structure and integrated operation system of the school enterprise community in which specialties, curricula and courses can be jointly set up by school and enterprises together.

(4) a framework for the construction of highly skilled personnel.

The framework for the construction of the high skilled personnel can be constructed from three aspects. First, the structure, type and level of the construction of the high skilled personnel should be oriented towards the demand of employment and enterprise post; Second, the main stakeholders of the construction of skilled talents are the enterprises with vocational

education training institutions, industries, social communities and workers as assistants; Third, the construction of skilled talents should be guided by government and participated by industries and social communities as regards its management. These aspects can be summarized as the specific framework.

5.2.6 Government Responsibilities for the Construction of High Skilled Personnel

(1) establishment of a joint meeting system

The government plays a leading role in the construction of high skilled personnel as a major active leader responsible for offering job opportunities, improving the labor market and creating a good social environment. Therefore, a joint meeting system should be set up under the leadership of the Zhongshan talent leadership group (the members of the joint meeting may be composed of Human Resources and Social Security Bureau, the development and Reform Bureau, the Finance Bureau, the Public Security Bureau, the Education Bureau, the Health Planning Commission, the Housing Construction in Urban and Rural Bureau, the Credit Bureau, the Human Resource Management Office and the Vocational Schools and so on) and functional offices are required to set up in local Human Resources and Social Security Bureau (or co-established with departments of other group members).

(2) the functions of the joint meeting

The function of the joint meeting is to hold meetings with relevant members on a regular basis to identify and solve some key and difficult problems in the work of highly skilled personnel. The responsibility of the office is to do a good job of investigation and statistics and demand prediction for high skilled personnel to know the current development of high skilled personnel and to publish the lists of highly demanding types of high skilled personnel on a regular basis. It also helps vocational colleges and universities to adjust the direction of training high skilled personnel according to the market demand and make correct evaluation and monitoring of vocational education so that education management and teaching reform can be promoted and deepened, the preferential policies for highly skilled talents with regional and practical skills may be formulated. One should do a good job of theoretical research on the work of highly skilled talents and form a working mechanism for highly

skilled talents so that enterprises, institutions and other relevant units to are better coordinated in the construction of highly skilled personnel.

(3) Inspection and supervision

It is an important part of the annual assessment of governments at all levels and related functional departments to assess the construction of high skilled personnel and to include the governing institutions, surveys and statistics, published directories, training and introduction, and funding into the plan for national economic and social development. At the same time, experts are introduced to inspect the work of township and functional departments twice a week and give opinions and some advice on the existing problems.

5.3 Building the Training System for Highly Skilled Talents According to Master-apprentice Effect

5.3.1 Establishment of the Apprenticeship Training Mechanism

The master-apprentice effect in the training of high skilled talents refers to the fact that when adequately trained and instructed by a master an apprentice avoids detours with crafts inherited from master and even makes creations easier than a person of the same trade, thus achieving twice the result with half the effort, and sometimes a talent chain of master-apprentice takes its shape (Lenin, 1972). Skill is experiential thing because it depends on people's experience in the process of practice. The imparting of the skills can only be carried out by the way of experience, in which people master the secret of every skill by the experience of working with their masters in operation or on their own (Simonton, 1998). It means that the knowledge is passed on by both words and deeds of respectable teachers who teach students hand by hand individually on the work field to integrate the morality, academic and learning strategy of both students and teachers to realize the inheritance and innovation of "the secret of skills". This is the sound and reasonable rule that should be followed in the enterprise training. Enterprises undertake the important task of training, using, assessing and evaluating highly skilled talents as a main actor in cultivating high skilled personnel responsible for specific training arrangements. A qualified enterprise should implement the

trainer system and the system of learning from famous teachers, in the way that someone is formally acknowledge as one's master by promises made by students. The learning method of work and study in the working practice should be promoted to internalize the knowledge and competence by direct acquisition of occupational experience and abilities, thus profits can be increase and production technologies promoted for enterprise part. The work and study method is similar to master-apprentice system as both sides emphasize the importance of learning from an expert or master in the working field.

As the first way of learning by doing work-integrated learning refers to the integrated learning mode in workplace of the enterprise when the time and space needs to be integrated in the process of learning which belongs to the category of individual learning.

Distributed learning is the second way to learn by doing. Distributed learning is a new type of concept and model of enterprise training compared to the traditional centralized training method. It is a learning way that study is getting through the whole process of work. It has simultaneity in time. The learning space can be the post or not the post, and it can be the individual learning and group learning.

Learning island is an effective form of decentralized learning widely used in German manufacturing enterprises. Learning Island aims at promoting the formation of employees' professional ability through post practice and job tasks and providing career development space for highly skilled talents. The implementation of learning islands is briefly described as the steps to analyze tasks and skills, to select jobs, to establish learning facilities and objectives, and to design learning Island tasks. (Lu Liang, 2011)

5.3.2 Setting Up a Training Base Platform for High Skilled Personnel

The government should build a platform for high skilled personnel. First of all, authorities should actively establish a new management model. It attaches importance to the role of the market adjustment, to raise the construction funds from many aspects except for government funds. The administrative department of education should fully mobilize all aspects of the power of the society, especially the industry association and the large and medium-sized enterprises to strengthen the construction of training bases for highly skilled

talents.

Secondly, the training bases can be established in cooperation with vocational colleges and universities for enterprises with large scales, high technology and management standards or those in rapid development. This is a fast way to cultivate highly skilled talents for enterprises.

Thirdly, flexible and diversified forms to train highly skilled talents can be adopted. For example, short-term training courses, technical skills competitions, research projects and further study sent to other enterprises can be held on a regular basis.

Fourth, it is necessary to build a public training system. The role of the comprehensive platform of the public training base can be given full play when the staff of the enterprise, the vocational college students and the social personnel are introduced to the public training base to improve the actual working ability. It needs to continue to explore and innovate the operation and management mechanism of the public training base, expand the practical training scale, and actively develop training projects with high skills and technical content. Schools and enterprises having greatly contributed to the training of highly skilled personnel should give priority to the establishment of high skilled personnel training bases with preferential policies and fund support provided by government. Meanwhile, enterprises that actively undertake the probation task should have certain material rewards (Pan & Lin, 2012).

5.3.3 Improving the Training System of High Skilled Personnel

It needs to improve the training source of vocational education since vocational colleges play a fundamental role in the construction of highly skilled talents. At present, faced with the transformation of educational concepts and the reform of teaching methods vocational colleges must set up specialties according to market demand to strengthen the school concept of "demand first". The cultivation of highly skilled talents should be centered around the national and local economic development to set up characteristic and powerful specialties. The education must be transferred from the "subject based" to the "ability based" model, and good practice conditions and teaching resources must be created, and the practical, comprehensive and characteristic training materials must be worked out. Higher vocational

colleges must break the closed mode of school operation by combining production with learning, schools and enterprises, work and study respectively. In the process of training high skilled talents, school and enterprise cooperation should give full play to the advantages of education and make full use of the enterprises resources. According to the characteristics of "one town and one product" and the practice of the economic zone, the vocational education is arranged by the municipal level to adjust the development layout of Vocational Education in Zhongshan to promote the characteristic and dislocation development of the vocational colleges and universities, realizing the seamless docking of vocational education and industrial development. The professional setting can be deeply improved by the establishment of a Professional Setting Committee at the municipal level. Abided by the employment rate, the employment direction, the enterprise evaluation and so on the Committee makes adjustment every two years so as to realize the scientific and institutionalization of the professional setting. Furthermore, it needs to explore the Run-through Cultivation by strengthening the communication and cooperation between secondary vocational schools and higher vocational colleges in the city, and maintain the interlink between vocational and vocational colleges, and carry out the training model of high skilled personnel in secondary vocational and vocational education.

The training of operation skills needs to be strengthened. Training should adhere to the idea of "enterprise as main body, government guidance, association participation and social support". It should conform to the law of growth of high skilled personnel, and give full play to the main role of enterprises in cultivating high skilled personnel to guide more skilled workers to become talents in this position. All kinds of enterprises, especially large and medium-sized enterprises, should formulate the training plans for high skilled personnel as one part of the enterprises overall plan for development in accordance with the production and development of enterprises and technological innovation. It also needs to establish the training system of staff and workers according to law, carry out the extraction of the funds for professional training of enterprises, strengthen the training of the job and the training of post skills, and strengthen the training of rare skills such as electronic and electrical appliances, mahogany furniture, textile dyeing and finishing, printing packaging, boiler machine repair,

etc. Large enterprises and trade associations are encouraged to organize skills training to make skills training closer to the needs of enterprises. One should establish an equal training system for migrant workers in cities and towns, regardless of household registration as a lifelong training. It needs to speed up the training of high skilled personnel and improve the lifelong skill training system through self-run training institutions or joint education with vocational colleges and training institutions. It can be encouraged and supported to establish Skills Master Studio by necessary funds offered by municipal government. The departments concerned should gradually give policy preference the establishment of certain types of certificates to enterprises, to enhance the enthusiasm of employees in the training and promotion.

Deepening the cooperation between school and enterprise. For the school and enterprise, it needs to emphasize jointly cooperation to work out training plans while sharing education resources in a variety modes to realize the effective connection between training and use to achieve more effective effect with win-win results. Two modes of school enterprise cooperation can be adopted, one is the mode of "order training", and the other is the co-cultivation mode in the way that training goals and plans are jointly designed by both sides. Other modes like the mode of internship can also be adopted if school and enterprise interpenetrate deeply with each other. The cooperation between school and enterprise needs to be raised up in quantity and quality to promote overall training effect. The teaching method of study and work is applied to divide the whole learning process into school learning and enterprise work. The sectional teaching organization is adopted in the way that students study basic theoretical knowledge in school for the first school year while learn special skills in workplace for the second and third year. Meanwhile, the rights and obligations of the school and the enterprise are clearly defined for better management of the cooperation between two sides who jointly determine the training scale and standard, the teaching plan and the syllabus. The training funds are jointly raised by the schools and enterprises to ensure the high quality of training. Cooperation management institution can be established to collect various excellent resources to realize the optimal allocation of information, talent and resources so that educated talents meet enterprise needs, and school and enterprise can actively interact

with each other with effective incentives and certain subsidies given to qualified enterprises.

The training mode of school and enterprise cooperation needs be society-oriented. With the direction of "employment oriented, service for the purpose" and the enterprise oriented vocational education, the specialty needs to be set up according to the demand of the enterprise market with focus on the training of the students' technical practical ability. One should focus on the vocational and technical schools in Zhongshan and strive to improve the effectiveness of teaching. One should break through the barrier between secondary vocational school and higher vocational college and carry out cultivation through training so as to meet the needs of enterprise's production development. It will fundamentally change the dilemma of school enterprise cooperation, establish a real type of cooperative management organization, integrate all kinds of advantage resources, realize the optimal allocation of information, talent and resources, increase the agreement between the professional and enterprise needs, and promote the interaction and cooperation between school and enterprise. It needs to promote order, directional training to strengthen cooperation between school and enterprise. The specialty, the scale and standard and the plan and outline of training should be in accordance with the needs of the enterprise with the training funds are jointly raised by the school and the enterprise for high quality. Take the experience of Heilongjiang as example, we may establish a variety of modes, such as investment cooperation, advanced study and improvement, directional dual style, school run enterprise and so on to realize effective connection between training and use. Through propaganda of public opinion platform, the government can improve the enthusiasm of enterprise participation, enhance the social reputation of enterprises, and encourage more enterprises, industries and social forces to actively participate in the training of high skilled personnel.

5.4 Improving the Development And Communication Mechanism of Highly Skilled Talents

5.4.1 Improving the Recruitment Platform

Human resources institutions in Zhongshan need to have its own demonstration

institutions, with high brands to introduce high skilled talents from home and abroad. They should give corresponding rewards to the highly skilled talents introduced by the talent agency according to their abilities and contributions made to society. The introduction of talents needs to expand from general workers to skilled workers, especially high skilled laborers. They also need to strive to achieve the goal of introducing 5000 people every year by 2020. They may expand cooperation with other provincial vocational schools by adding two to three University platforms annually and introducing a certain number of graduates. Graduates from technical schools and graduates from vocational colleges will be given certain subsidies in accordance with the amount introduced.

They should attach great importance to the development and cooperation of human resources in enterprises by strengthening the contact with higher vocational and technical colleges and universities beyond Zhongshan city. Large scale labor market will soon be set up by integrating 25 the secondary human resource markets, 279 human resources networks in service stations, and seven provincial labor services offices in Zhongshan. The allocation and distribution of high skilled personnel resources are gradually realized by the investment in practical living problems like children's schooling, housing, medical treatment and so on.

They should hold technical exchange activities regularly. Institutions can develop and protect the traditional folk arts with national characteristics and achieve intergenerational transmission by organizing activities such as technical exchange, exquisite technical display, advanced operation method demonstration, and promotion of inventions and skills innovation projects.

5.4.2 Introducing More High-skilled Talents By Giving Rewards and Subsidies

Enterprises should be encouraged to introduce highly qualified skilled talents abroad by offering certain attracting treatment. For highly skilled talents who are actively introduced by enterprises local bureau of finance shall give appropriate subsidies or awards according to their years of labor contracts. To the example of many other countries, there are advantages in exploring and introducing highly skilled talents from abroad who are in urgent need in China. Enterprises that import talents from abroad may be subsidized at different levels. The high

skilled personnel working in Zhongshan, according to the degree of technical contribution, shall be given corresponding subsidies by the relevant supporting policies for high skilled personnel in Zhongshan just as what happened in Kunshan where a reward of 1000 yuan per person was given to highly skilled talents introduced to Kunshan for the first time.

Giving higher rewards and subsidies than ever before. Decision makers should set up the corresponding skill allowance system according to contributions talents made to Zhongshan's industry and enterprises especially those who play the leading role in the production and make outstanding contributions to the enterprises. Lessons can be draw from Kunshan's highly skilled talents reward system that grant 1.8 - 7.2 million yuan subsidy to outstanding and highly skilled talents selected every year for three years. There should be established a subsidy system for technicians implemented by municipal and town governments and provide government subsidies for technicians and senior technicians in order to retain highly skilled personnel. Enterprises should be encouraged to implement equity and option incentives for highly skilled talents.

Improving the treatment of high skilled personnel. The evaluation results of skilled personnel will be linked to the salary, and the salary determined by skill and post should be implemented. Human resources and social security departments should embody the inclination of the salary guidance in the skills and high skilled jobs, improve the evaluation and employment system of professional qualifications, and make the people with high professional qualifications have their own salary. Enterprises should consider the contribution rate of workers' professional ability, break the status restrictions, and improve the salary system for highly skilled talents. (Li, 2008)

5.4.3 Promoting the Rational Flow of Highly Skilled Talents

It needs to guide the flow of highly skilled talents according to the market demand. Market orientation seems not to be an option but instead a sure trend. Therefore, it is important to safeguard the lawful rights and interests of employing units and highly skilled personnel in accordance with the law, and ensure the standardization and orderliness of the flow of talents. Authorities should gradually establish a mechanism for the flow of highly

skilled talents and regional cooperation, and encourage them to play a role through part-time, service, technological tackling, and project introduction.

Need to improve the talents flow service. Information on supply and demand of high skilled talents should be released regularly to let talents go job hunting according to the market demand. It needs to provide "one-stop" service for highly skilled talents including various services such as job introduction, vocational training, employment contract visa, social insurance relationship handling, and archival filing, etc. A unified social security system should be established to make talents flow easily from different industries, units and regions to make them have their due rights to choose satisfying units and posts with high salary and good welfare.

5.5 Optimizing the Structure of Highly Skilled Talents Abide By the Symbiotic Effect

5.5.1 Equal Stress On the Introduction And Training of Highly Skilled Workers

Equal stress on the introduction and training of highly skilled talents should be put into practice by introducing high-end talents with special skills and professions in great shortage of job market and training local needed high skilled talents accordingly to make talents give full play of their abilities. Meanwhile, the introduction and training need to be consistent with the actual situation of the industrial development in Zhongshan with main focus on needed specialties and skills. While enjoying the preferential policies provided by Zhongshan municipal government, high skilled talents are required to sign a service contract in which the employment years are stipulated according to the actual situation of the enterprise.

5.5.2 Improving the Evaluation System of High Skilled Personnel

The evaluation system for the construction of high skilled talents needs to be guided by occupation competence with key focus on wok performance and morality. It means that occupation competence and work performance should be integrated in evaluation content, national standards and post requirements should be combined in evaluation standard ;

professional evaluation and enterprise approval are equally important in the evaluation mechanism, and administrative guidance and technical support can also be combined in the implementation of the organization. in the management system, the territory management is combined with industry management. The system should further break through the boundaries of proportions, degrees, qualifications and identities to create good conditions to facilitate the emerging of highly skilled talents.

The independent enterprise evaluation system of skilled talents needs to be promoted. It can be learnt from successful experience of some pilot enterprises such as Zhongshan Broad-Ocean Electric Machinery Co. Ltd, Vatti Gas Appliance which have their own enterprise evaluation system with social recognition. The industry association can also play advantageous role in this respect by encouraging the development of new types of work such as electrical appliances, red wood furniture, textile dyeing and finishing, lighting package, boiler machine repair and others with corresponding subsidies to make the certificates acquired by talents meet enterprises demand. Evaluation. Industrial authorities, associations and enterprises work together to study and formulate standards for the identification of high skilled personnel. After reviewed and approved by the local ministry of human resources and social security, the worker who have been recognized by the industry or enterprise to reach the level of senior workers and technicians with outstanding performance and great contribution to the production practice should be directly identified as a senior worker or technician according to practical production and operation in enterprise. The skilled workers with high level in key posts of enterprise may be allowed to take part in professional skills identification within or without the limits of work life. It is necessary to establish a high-level talent evaluation system for enterprises, breaking through educational background, title, qualification and identity limit, highlighting the factors of ability level, achievement contribution and invention and creation. It needs to make the high level talent evaluation standard operable and connective to practical application in enterprise t to make it close to the actual production while the core competence of the staff and workers may give full play and more outstanding talents stand out with higher work performance.

Government evaluation and enterprise identification should accord with each other. If it

is possible, the practical post standards of enterprises should be connected with the national professional standards so that talents may acquire the qualifications of technicians and senior technicians by professional title assessment system. The actual operation ability of solving key production problems should be taken into consideration for the evaluation of technical and skilled talents. The ability of mastering new technology and knowledge should be taken into consideration for the evaluation of talents who have interrelated knowledge and skills. The technical ability of using versatile skills should be take into consideration for the evaluation of compound skilled talents.

It needs to improve the existing system of identification mechanism. The system should vigorously develop the types of work suitable for the development of Zhongshan's economic industry to promote talents flow from old to younger generations. The system may benefit by providing more channels of developing, training and employment for talents in Zhongshan so that work experience of the high skilled personnel of various types of work expands widely around the city. Furthermore, the range of needed types of work can be identified to establish more practical appraisal institutions which has Zhongshan characteristics so that more talents can be appraised and approved in a justified and open managerial system.

5.5.3 Establishment of High Skilled Personnel Assessment Mechanism

The successful construction of highly skilled personnel lies in the establishment of a reasonable assessment mechanism. The system should strengthen the assessment of vocational skills and scientifically assess the skill level of skilled talents. The assessment of high skilled personnel should be included in the overall assessment of the relevant units in the township and city areas. Every year, the high skilled personnel in the city and the township enterprises should be examined. The authorities should further improve the system of professional skills appraisal management and quality supervision, standardize the appraisal procedures, and build and perfect the talent assessment mechanism that reflects Scientific Outlook on Development. And in the process of assessment, one should pay more attention to the actual operation level of skilled personnel and the degree of contribution to the enterprise. It is necessary to make clear the target talents who need to be assessed and evaluated. Skill

identification service should be provided in time for the high skilled personnel who are in accordance with the conditions stipulated in the state's professional standards. Identification of skill evaluation should be offered to workers in enterprises who have worked for many years and have acquired qualified high skill with much practical work experience. Job promotion and the priority of quality evaluation should be available for excellent skilled talents who stands out in skill contests or professional competitions. Other talents who are willing to take part in professional evaluation system should be open to have equal evaluation service. Meanwhile, multi-evaluation system needs to be explored for high skilled talents.

5.5.4 Improving the Mechanism of Retaining High Skilled Personnel

The identification and recognition need to be combined to assess backbone talents. That means like this, enterprise or industry association identify the talents who are then recognized by government after some examinations. The treatment of high skilled talents should be accord with their skill level and contributions made society. Some practical policies may be adopted to raise up their status in society. The first and foremost is housing and children school entrance. To retain high skilled talents, government should provide some preferential policies to give talents more chance to register in local households abide by their skill level and contributions made to local area. The Points-based Hukou system should be available for more skilled talents and let more children go to local schools. Besides, social security system needs to cover more high-skilled talents in various forms such as allowance, welfare, training and others. The minimum salary level needs to be set up to make people are willing to enter Zhongshan. Equity and option incentives may also play an important part in retaining high skilled talents.

5.6 Improving the Incentive Mechanism for Highly Skilled Talents

5.6.1 Actively Carrying Out Commendation Activities

Zhongshan has advantages in carrying out commendation activities to select highly skilled talents to improve the social status of highly skilled talents and encourage more

business skills talents to develop themselves and become elites. Drawing on the experience of Dongguan and Shenzhen, the city holds a citywide selection of highly skilled personnel every two years. After several steps of selection including the recommendation of the enterprise, the first instance of the town, the municipal level review, the social publicity 10 outstanding and highly skilled personnel are selected when commendation conference is held in the name of the municipal government. High skilled talents, devoted enterprises, excellent training institutions and vocational colleges are all awarded due rewards accordingly.

5.6.2 Vigorously Developing Skills Competitions

It is beneficial to improve the overall quality of high skilled personnel by carrying out a variety of professional skills competitions so that they learn technology and improve their skills and realize their own value. The activities should adhere to the principle of meeting the needs of the enterprises and the actual production. It needs to constantly improve the organizational procedure, the conditions and contents of the competition. All social forces should be guided and encouraged to carry out various forms of post training, technical competition and professional skills competition activities and use the results of competition and training to identify the professional qualifications indirectly and use a variety of effective competition methods to encourage outstanding high skilled talents to come out.

The municipal skills competition project is not less than 10 items per year, and the scope of the project is constantly expanding. Appropriate subsidies can be given to the municipal skills competition organized by the competent departments of various industries, and the requirements are included in the budget of each special fund or department. Enterprises should be encouraged to carry out skills competitions according to their jobs and positions and improve their skill level through post training.

The all vocational colleges of the whole city are encouraged to hold "skill Festivals" every year. Skill competitions are selected to organize and promote the enthusiasm of students' learning skills through training and learning. For the provincial and municipal skills awards, especially the two prizes in the province and the first prize in the whole city, it is directly identified as a technician or a senior worker and given the appropriate rewards and

related treatment according to the award-winning level. The technicians and senior technicians who have been employed enjoy the same treatment as engineers and senior engineers. At the same time, stakeholders should intensify their efforts in rewarding outstanding and well recognized skilled talents.

5.6.3 Taking Measures to Improve the Treatment of Talents

Talents should be treated in a way that allows the exploration of the system of "chief workers" and "chief technicians" placed in key positions and key processes, and gradually establish a mechanism for the use of high skilled personnel with unified standards, independent declarations, social assessment and employment created in the business sector.

The employment system of technicians and senior technicians should be explored, giving full play to its key role in the technical post and the important role in solving technical problems, implementing excellent project projects and taking apprentice technology.

According to their own development needs, enterprises should be encouraged to explore the system of leading people with high skilled personnel and give full play to their positive role in making major production decisions, organizing major technical innovations and technical projects, and giving support for funds and other aspects.

It also needs to carry out the salary survey of high skilled personnel in enterprises, timely release the salary guidance line and guidance price of human resources market. Zhangshan may refer to the high skilled personnel wages in Zhuhai, Dongguan, Guangzhou and Shenzhen, and urge the enterprises to adjust and implement the salary treatment of high skilled personnel. The system of compensation and compensation for high skilled personnel should be set up. Enterprises should be encouraged to implement equity and option incentives for highly skilled talents to further improve the treatment satisfaction of skilled personnel.

According to Zhongshan's talent policy, it should give corresponding housing subsidies, government subsidies and other welfare benefits to the highly skilled talents. In terms of employment, wages, paid study, training, vacation, and study abroad, the appropriate incentives should be formulated. Priority should be given to the settlement of the household and the priority of the children to attend public schools in public rental and low rent housing.

In addition to material incentives, it can also seek a variety of incentive methods, such as target incentive, trust incentive, emotional incentive, behavior incentive, reward and punishment incentive, competition incentive and so on, and establish a set of effective incentive mechanism. The high and new technology enterprises are allowed to explore and implement the income distribution system that is conducive to encouraging the creation and innovation of excellent and highly skilled talents. Zhongshan should fully consider the contribution rate of the workers' professional ability to break the identity limit, and let the high skilled personnel develop better with their research results in technical titles. (Li, 2008) The system should rely on the continuous improvement of treatment to mobilize the enthusiasm of highly skilled talents.

5.6.4 Establishing And Improving the Social Security Mechanism

Social security system. Highly skilled personnel can be transferred across the whole area, and the basic old-age insurance personal account funds will be transferred according to regulations. The enterprises with proper conditions should actively explore the enterprise annuity system and the supplementary medical insurance for all kinds of talents, including high skilled personnel in the line of production and service.

The pluralistic investments mechanism. The investment mechanism of government, enterprise and society is set up. Through the preferential policies of finance and taxation, finance and other preferential policies and specific implementation plans, various training channels are guided to play a role, and the special funds for training high skilled personnel are gradually increased. It is mainly used for training education, commendation, teacher training and teaching and research of high skilled personnel.

Do a good basic work. The theoretical research on highly skilled talents should be strengthened while promoting the rule of law for highly skilled talents. Zhongshan should build a scientific professional and curriculum system, strengthen the construction of "double quality" teaching staff, and constantly improve the social security work for teaching staff. It should do a good job in the investigation and statistics and demand forecast of high skilled personnel, perfect the information exchange platform for high skilled personnel, and develop

the information base of high skilled personnel and the information base of skill results. Authorities should speed up the compilation and revision of the national professional standards of technicians and senior technicians, strengthen the development of vocational skill identification questions database, and improve the quality supervision system of vocational skills identification.

5.7 Creating a good environment for highly skilled talents

5.7.1 Innovating the Working Environment for High skilled Personnel

Adhere to the cause of retention, treatment and retention, cultural retention, emotional retention. In order to guide the enterprise to overcome the tendency of the small wealth of prosperity and the present situation, to support the development of the key enterprises and encourage the small and medium enterprises to go on the market, the enterprises should be forced and encouraged to upgrade. Authorities should implement preferential policies such as enterprise tax return, and guide enterprises to implement equity incentive and enterprise annuity to attract and retain talents by the development of enterprises and employees. Authorities should advocate the establishment of a harmonious labor relationship, the conclusion of a relatively long labor contract, the construction of a harmonious labor relationship, the optimization of the working environment and the strengthening of the ideological consciousness of "the enterprise as the home". Enterprises or governments are encouraged to provide high skilled personnel with the opportunity to absorb advanced technology at home and abroad by organizing big lecture hall, big forum and overseas study, and support the development of scientific and technological innovation and set up a platform for developing talent. It is very important a "harmonious labor relationship enterprise" and "100 best employers" every two years are carried out, to urge enterprises to strengthen humanistic care and build a harmonious and happy working environment.

5.7.2 Innovating the Living Environment of High Skilled Personnel

Governments at all levels should care about the life of highly skilled personnel,

constantly improve the comprehensive service function of the city, and reduce the burden of skilled personnel on housing, transportation, children's education and medical care, and strive to provide a safe and comfortable living environment for high skilled personnel. It needs to simplify the procedure and improve the service level of solve the practical problems like household registration and children school entrance to relieve the worries of the high skilled personnel. Besides it also needs to increase the strength of the labor supervision and law enforcement by urging all the members of the enterprises to participate in the insurance, to allow the high skilled personnel to enjoy the social insurance treatment. Moreover, it is better to encourage the government to provide public rental housing with low price or land for enterprises to build housing to make more talents have houses to live. Furthermore, it also needs to adjust bus routes, improving the comprehensive service function of the city to enhance the convenience and happiness of life.

5.7.3 Innovating the Social Environment for High Skilled Personnel

The construction of highly skilled personnel is a major issue related to the economic and social development of Zhongshan. It should arouse the attention of all sectors of society. To further improve the importance, urgency, long-term and arduous understanding of the party committees and governments at all levels to the construction of high skilled personnel, the system should put the work of strengthening the high skilled personnel in an important position and make overall arrangements and specific arrangements for the work of high skilled personnel under the new normal economic development. Authorities should give full play to the publicity of various media, such as newspapers, radio, television and network and organize various forms of propaganda, and vigorously promote the important role and outstanding contribution of high skilled personnel in economic construction and social development. Through extensive and lasting publicity, the traditional concept of "skilled workers is not as good as white-collar" will be fundamentally changed, and high skilled talents are widely respected by the whole society as well as scientists and engineers. The system should give full play to the basic role of the market in the development and allocation of highly skilled personnel resources, vigorously introduce and train high skilled personnel of enterprises, and form a whole society with respect for labor, respect for knowledge, respect

for talents, respect for the era of creation, and guidance and encouragement for the workers to study hard and develop their skills. The system should strive to create a system environment and a social atmosphere conducive to the growth and development of highly skilled talents. In the future, Zhongshan should adjust the policy of high skilled personnel to improve the training mechanism of high skilled personnel by providing relevant policies and regulations. It also needs to accelerate the system innovation and perfect the supporting policies to introduce, train and develop high skilled personnel, thus the first and intermediate skilled workers may go to the high end, and a contingent of high skilled personnel with sufficient quantity, reasonable structure and exquisite skill will be constructed. Most importantly, it helps to promote the upgrading of industry and the construction of happiness and the beauty of Zhongshan.

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Appendix: Interviews and Questionnaires

Questionnaire Number: _____

Survey of the Construction of High Skilled Talents in Zhongshan City

Dear Sir or Madame:

Hello! Thank you for your supporting and participating in this study. This questionnaire survey is carried out to provide decision-making reference for the work of the construction of the high skilled personnel in Zhongshan. The so-called high skilled personnel refer to people with superb and sophisticated skills who make creations in their work to contribute to our society including skilled workers, technicians and senior technicians with professional qualifications. The survey will be conducted in an anonymous way and all the information collected in a statistical manner will be held in confidence so please feel free to fill in it honestly. Thank you for your cooperation and help.

Survey research group

July, 2014

Notes for questionnaire filling:

1, Make sure that you have ticked off the one you like to choose or fill in the appropriate content in each blank line.

2, For each question you can only choose one answer unless otherwise stated.

3, Please do not consult others when you fill out the questionnaire.

4, There are still some instructions that are scattered after the questions to explain the requirements, ways and methods of filling.

5, if you choose others please give reasons.

I. Basic personal information

1. Your age:

A.25 years old B. between 25 to 35 years old C. between 36 to 45 years old D. above 46 years old.

2. Your sex:

A. male B. female

3. Educational levels:

A. doctoral candidate B. postgraduate C. undergraduate D. College E. secondary school F. high school G. junior high school H. primary school

4. Do you have a professional qualification?

A. junior technician B. intermediate technician C. senior technician D. technician.

E. senior technician F. none

5. The type of you professional work is:_____

6. Your current the way of housing:_____

A. live with other family members B. live in own purchased house

C. live in apartment offered by enterprise

D. renting (account for____% of your total income) E. others

7. Do you plan to live in Zhongshan for the rest of your life:

A. Yes B. No C. Never think about it.

II. The present working status

8. Does your company attach great importance to highly skilled talents?

A. attaches great importance B. attaches importance

C. generally does not pay much attention D. never attach importance

9. Are you satisfied with what you are doing in the enterprise?

A. very satisfied. B. quite satisfied. C. not bad D. not very satisfied. E. very unsatisfied

10. What are the aspects of satisfaction / dissatisfaction? Satisfying aspects: _____ dissatisfying aspects: _____ (the selected letter is filled in the line)

A. salary B. promotion C. social environment D. employment opportunities E. others_____

11. Does your professional expertise be fully developed?

A. very fully B. relatively full, C. general D. not enough, E. difficult to develop

III. Salary, welfare and living conditions

12. Your current average monthly wage:

A.1500 to 2000 yuan B.2001 to 3000 yuan C.3001 to 5000 yuan.

D.5001 to 8000 yuan E.8001 to over 10000 yuan F. above 10000 yuan.

13. Are you satisfied with the current income situation?

A. very satisfied. B. quite satisfied. C. general D. not very satisfied. E. very unsatisfied.

14. Does your company provide social security?

A. yes B. no

IV. Further training and career development

15. Does your company provide regular skills training to employees?

A. never B. Few times C. Many times D. Always

16. Are you satisfied with the skill training offered by the enterprises?

A. very satisfied. B. quite satisfied. C. general D.not very satisfied. E. very unsatisfied

17. Have you participated in skill training in the last three years?

A. Yes B. NO

18.Do you have the existing knowledge and skills to meet the needs of your current job?

A. fully meet B., C. almost meet D. basically meet E. unable to meet

19. Do you have any plans to further improve your skill level?

A. yes B. no

20. what do you think is the most effective way of training?

A. technical school B. social training organization C. enterprise training D. network training

F. others_____

V, Internal flow and occupational mobility

21. How many times have you changed your job since you took part in the work?

A. none B. once C. two to three times D. above three times

22. Affecting factors for the change of work: First: _____Second:_____ Third:_____

(pick the most important three factors or not fill) A. enterprise development prospects B.

personal development opportunity C. salary and welfare treatment D. working environment

conditions

E. good interpersonal relationship F. has better training and learning opportunities G. others.

23. Does your company set up a system of talent evaluation and selection?

A. yes B. no C. unclear

VI. Interaction between government and enterprises and relevant support from the government.

24. Are you satisfied with the Zhongshan municipal government's policy of talent development?

A. very satisfied. B. quite satisfied. C. general D. not very satisfied. E. very unsatisfied

25. What kind of support do you think the government should provide for the construction of highly skilled talents in Zhongshan? (pick the three most important factors) first:_____ Second: _____Third:_____ (fill in the selected letters in the line).

A. funding input B. skills training C. technical guidance D. regular promotion.

E. endowment funds protection F. preferential policies for talents' children entry school

G. optimizing the working environment H. others_____

26. Your views on the Zhongshan municipal government's work on the construction of high skilled personnel

27. What suggestions do you have for the government and enterprise to do well in the work of the construction of highly skilled talents in Zhongshan city?

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Government related services	The degree of Satisfaction					areas for improvement
	Very satisfied	Satisfied	General satisfied	Not satisfied	Very unsatisfied	
give employment and business starting guidance						
Assisting spouse employment						
Facilitate children entry school						
Medical and health service						
Social security protection						
Other services(pls list out)：_____						

Questionnaire Number: _____

Survey of the Construction of High Skilled Talents in Zhongshan City

Dear Sir or Madame:

Hello! Thank you for your supporting and participating in this study. This questionnaire survey is carried out to provide decision-making reference for the work of the construction of the high skilled personnel in Zhongshan. The so-called high skilled personnel refer to people with superb and sophisticated skills who make creations in their work to contribute to our society including skilled workers, technicians and senior technicians with professional qualifications. The survey will be conducted in an anonymous way and all the information collected in a statistical manner will be held in confidence so please feel free to fill in it honestly. Thank you for your cooperation and help.

Survey research group

July, 2014

Notes for questionnaire filling:

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2, For each question you can only choose one answer unless otherwise stated.

3, Please do not consult others when you fill out the questionnaire.

4, There are still some instructions that are scattered after the questions to explain the requirements, ways and methods of filling.

5, if you choose others please give reasons.

I. The basic information of the enterprise

1. the name of your enterprise:

_____

2. the total number of employees of the enterprise:

A.below 500 B.500 to 1000 C.1001 to 3000 D.3001 to 5000

E.5001 to 10000 F. over 10000

3. What type of enterprise you are working in?

A. state-owned enterprises B. private enterprises C. Sino-foreign joint ventures

D. foreign enterprises (including Hong Kong, Macao, Taiwan) E.others_____

4. Which pillar industry your enterprise belongs to?

A. electronic information industry B. equipment manufacturing C. health pharmaceutical manufacturing D. new energy industry E. textile and garment industry F. electrical machinery and metal products manufacturing G. others_____

5. Which traditional industries your enterprise belongs to?

A. lighting industry B. hardware products industry C. textile and garment industry D. mahogany furniture industry E. home appliance F. others_____

6. the number and structure of skilled talents at present enterprise: (fill in the appropriate answers in the box)

	Total number
Senior technicians level 1	
Technician level 2	
Senior workers grade 3	
Intermediate workers grade 4	
Primary workers grade 5	
Skilled workers without certificates	

7. The relevant awards including qualifications, patent applications, research awards, etc. acquired by skilled talents (fill in the appropriate answers in the box).

The award level	number
National level	
Provincial level	
Municipal level	

8. Current situation of skilled workers' Income: (fill in the box with the right answer)

Skill level of talents	Average monthly wage (yuan)
Senior technicians level 1	
Technician level 2	
Senior workers grade 3	
Intermediate workers grade 4	
Primary workers grade 5	
Skilled workers without certificates	

II. The demand for high skilled personnel in enterprises

9. At present the percentage of highly skilled personnel in the total number of employees is:

A. below 10% B.10-20% C.20-30% D.30-40% E.40-50% F. above 50%

10. How much do you think is the ideal percentage of highly skilled personnel in the enterprise (in the total number of employees)?

A. below 10% B.10-20% C.20-30% D.30-40% E.40-50% F. above 50%

11. At present the highly skilled talents who are in short supply include: (pick the three most scarce talents).First:_____ Second:_____ Third:____ (select letters and place it in the line).

A. senior technician B. technician C. senior worker D. intermediate worker E. primary worker F. skilled workers with no certificates

12. The urgent needed number of highly skilled personnel in the enterprises:

Skill level of talents	Total number
Senior technicians level 1	
Technician level 2	
Senior workers grade 3	
Intermediate workers grade 4	
Primary workers grade 5	
Skilled workers without certificates	

III. The introduction of high skilled personnel in the enterprise.

13. What is the most important channel for enterprises to introduce highly skilled talents?

A. social recruitment B. enterprise training C. school enterprise joint training D. by local technician school or training institutions direct recruitment E. to recruit from other provinces F. other ways_____

14. What are the most needed channels for enterprise to broaden to introduce highly skilled talents?

A. training of technical schools in this city B. training in enterprise by themselves, C.

training by cooperation between schools and enterprises D. recruiting from other cities E. cooperation and exchange with vocational schools in other cities F. others_____

IV. The training of high skilled personnel

15. is there a short-term (annual) or long-term high skilled talent training program?

A. no B. has short term plan C. have long term plan

16. the most important way for enterprises to train highly skilled talents is:

A. recruiting external teachers B. internal expertise staff training (internal training) C. select staff to go out for further education. D. employees improve their skills on their own E. master-apprentice method F.employees join in national examination, G. others_____

V. The situation of retaining high skilled talents in enterprises.

17. Do you think the current treatment of highly skilled talents is attractive to them?

A. very attractive B. attractive C. general attractive. D. not very attractive E.not attractive at all.

18. What are the measures taken by enterprises to retain highly skilled talents: (multiple options)

A. raise salary B. perfect incentive system C. perfect guarantee system

D. perfect training system E. others

19. What are the incentive policies for skilled talents in enterprises?

Are there any related incentives?	Yes	No
A. Professional skill identification plans		
B. Income preferentical policies to skilled talents		
C. The link between income and skill level		
D. the establishment of allowance system for high skilled talents(skilled workers, technicians, senior technicians)		
E. the establishment of reward system for high skilled talents contributing to enterprise		

VI. Interaction between government and enterprise

20. Are you satisfied with the Zhongshan municipal government's existing talent policy?

A. very satisfied. B. quite satisfied. C. general D. not very satisfied. E. very unsatisfied

21. In your opinion, the most important measures to strengthen the construction of highly skilled personnel are:

A. provides family housing service B. provides children's access to school C. innovative talents management mechanism. D. the promotion of concept of talent management E.others._____

22. What do you think is most effective way to support the development of enterprises in the following items:

A. connecting with overseas B. training and introducing C. attracting investment and talents together D. inviting money and business E. win-win benefits with other cities in China.

23.what do you most want the government to support for the construction of enterprise skilled personnel,

A. policy support B. funding support C. incentive support D. optimize environment E. others_____

24. What are the suggestions for the government in order to enhance the professional ability of skilled talents?

_____

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Outline of the discussion on the construction of highly skilled talents in Zhongshan

I. attended enterprises:

II. attended people:

III. The location of the discussion:

IV. The time of the discussion:

V. The purpose of the discussion:

Objective:

The municipal government of Zhongshan city arranges the investigation according the requirements of "the planning for the development of Zhongshan in a medium and long term from 2011 to 2020 " and the proposal for the construction of high skilled personnel in Zhongshan drafted to form a good situation to attract talents so as to promote the healthy and rapid development of the city's economy. In order to provide valuable reference for municipal party committee and municipal government we hope that from the actual situation in the city you may give valuable and useful opinions and suggestions by the basic experience in the construction of high skilled personnel to solve the outstanding problems.

Requirements：

1. please carefully fill in the issued two questionnaire surveys on the construction of high skilled personnel in the city of Zhongshan.

2. You may provide the outline, related materials or the electronic manuscripts for our reference.

3. Please be actively participating in our talk about the experience , the problems that need to be solved by the government, and the suggestions for the construction of highly skilled personnel. To be more specific, the following aspects should be included, namely the basic situation of enterprises, the demand for high skilled talents, the introduction, training, retention, and the interaction between government and enterprises.

VI. Problems to be discussed are as follows:

(1) the basic experience and practice of the enterprise (the rational structure, demand, introduction, cultivation, flow and retention of highly skilled personnel).

1. What are the ways in which enterprises introduce, cultivate and retain highly skilled talents? What ways of your enterprise prefer to choose?

2. What are the commonly used incentives for high skilled talents? Which is the most effective?

3. What is the reasonable structure of the high skilled personnel at present (the ratio of the high skilled personnel to the whole staff; the proportion of the various grades; those most needed talents)?

4. What are the high-level qualifications, patent applications and research awards of highly skilled talents in enterprises?

5. What is the percentage of high skilled employees in the total number of employees? What is the best situation?

6. What is the most missing type of work in the enterprise at present? What is the demanding quantity?

7. Does the enterprise have a talent evaluation system and a talent management system? What are these systems?

(2) the existing problems and causes

1. what are the difficulties encountered by enterprises in the introduction, training and management of highly skilled talents? How to solve them?

2. what are the problems of enterprises in terms of social cognition, educational mode, talent evaluation and government input? What are the causes?

(3) countermeasures and suggestions

1. What kind of help and support does the government want to get from the government?

2. How to make a feasible and perfect plan for the construction of highly skilled personnel?

3. How to build highly skilled personnel training base and system?

4. How can we bring into full play the technological potential of highly skilled talents and improve the development and communication mechanism of highly skilled talents?

5. How can we bring in, train and create more talents and optimize the structure of highly skilled personnel?

6. How to improve the vocational qualification certificate system and improve the evaluation and incentive mechanism for highly skilled talents?

7. How to create a good social environment for the growth of highly skilled talents?

VII. Summary

As we have discussed above it has made a good introduction to the construction of the high skilled personnel team, found out some outstanding problems and put forward good suggestions, which have a great reference value to the formation of *the Research Report and the Opinion*. Then we will seriously analyze and study the problems and suggestions put forward by all of you so as to promote the healthy and sustainable development of our city's economy and society. Thank you all!