College and Enterprise Cooperate to Train Modern Craftsmen

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Abstract. In 2017, Government Work Report put forward that China should vigorously promote the spirit of craftsmen, cultivate many "Chinese craftsmen", create more world-renowned "Chinese brands" and promote China's economic development into the era of quality.

The transformation of China from a big manufacturing country to a powerful manufacturing country not only needs to improve the researching capability of science and technology, but also needs a very important supporting factor—modern craftsmen. Vocational colleges shoulder the responsibility of training technical and technical personnel. In the process of personnel training, both colleges and enterprises take the school-enterprise Community as the carrier. This paper aims to explore the modern craftsman training mode according to the current situation.

1. Introduction

In 2017, Government Work Report put forward that China should vigorously promote the spirit of craftsmen, cultivate craftsmen's culture, acquire people adhere to professional ethics, advocate excellence, improve incentive mechanism, cultivate many "Chinese craftsmen", create more world-renowned "Chinese brands" and promote China's economic development into the era of quality. China is a big country of skilled personnel and a big country of manufacturing industry as well. At present, China is in the critical period of transition from a big industrial country to an industrial power. So, cultivating modern craftsmen is necessary and urgent.

2. Literature Review

In recent years, many scholars have studied Industry Teaching Combination, College-enterprise Cooperation and How to Training Great Power Craftsmen. The Decision of the State Council on Accelerating the Development of Modern Vocational Education clearly states that it is necessary to "strengthen college-enterprise cooperation in educating people", "improve the system of enterprise participation" and "exert the principal role of enterprises in running colleges" in order to effectively improve the effectiveness of college-enterprise cooperation. “It is emphasized that we should firmly grasp the orientation of service development and employment promotion, deepen the reform of system and mechanism, innovate various types of vocational education modes at all levels, persist in the integration of industry and education, college-enterprise cooperation, persist in the integration of work-study and knowledge-action, in order to guide all sectors of society, especially industry and enterprises, to actively support vocational education and strive to build Chinese characteristic vocational education system.” Chairman Jinping Xi said.

From 2005 to 2018, taking the number of paper issued at China National Knowledge Infrastructure in the past more than ten years as an example, the author searches key words Industry Teaching Combination, College-enterprise Cooperation and How to Training Great Power Craftsmen to find 3044 papers. The study main focus on the importance and necessity of college-enterprise cooperation in Vocational education, its guarantee mechanism and application, the basic connotation of craftsman spirit, the reasons for the lack of craftsman spirit, the cultivation system of craftsman spirit, the social value of craftsman spirit and so on.

College enterprise cooperation originates from abroad; the researching level of vocational education in colleges abroad is higher than that in China.

In the late 1980s, J.P. Grander, an American economist, used qualitative analysis method for the
first time to describe and analyze the behavior of college-enterprise cooperation in detail from the perspective of the bilateral relationship between universities and enterprises and their interaction. Sumney (1989) believes that college enterprise cooperation is one of the main factors that affect national competitiveness. Geisler & Rubenstein (1989) categorized the issues related to college enterprise cooperation into six kinds. In "A new look at selected employ ability", Scholar Hill(1995) said that the professional spirit is a cultural norm for the worker, the work itself has its own intrinsic value, employees should be highly responsible for the work they are engaged in, reflecting the sense of responsibility of the work. In Young Children and Spirituality, Myers (1999) points out that professionalism is a deep-seated yardstick for individual employees in their work.

Geng Jie (2011) put forward three suggestions: to establish a cooperative mechanism between vocational education and industry, to further improve the funding guarantee mechanism based on government investment, and to improve the college-enterprise cooperative scientific research service mechanism of vocational education. Zhou Jiansong and Tang Linwei's (2014) treatise "Study on the Long-term Mechanism of College-Enterprise Cooperation in Higher Vocational Education" put forward the idea of constructing the long-term mechanism of college-enterprise cooperation. Qin Bin (2014) pointed out that the basic connotation of the deep integration of industry and education is integration of production, teaching and interaction between colleges and enterprises to realize the deep docking between the teaching process of Vocational Colleges and the production process of industrial enterprises. Chen Younian (2014) pointed out that the integration of production and education is a deep cooperation between vocational education and industry. In order to improve the quality of personnel training, industry colleges and universities carry out deep cooperation with industry enterprises.

Cai Jianping (2009), Chen Wanming (2012), Chen Yi (2014) and other people's scholars show that there is a time lag between the development of higher education and vocational education and industrial development, a benign interaction has not yet formed.

Deng Cheng (2014) pointed out in How Contemporary Vocational Education Shapes the Craftsman Spirit that the historical reasons and the present educational system are the important reasons for the general lack of craftsmanship spirit in today's society. Lin Yanling(2016), in "Cultivating Craftsman Spirit Focusing on Institutional Construction", holds that the cultivation of craftsman spirit should start with values, government governance and market demand guidance.

3. Concept Definition

3.1 Industry Teaching Combination

The integration of industry and education mainly discusses the relationship between education and industry, which is subordinate to the relationship between education and economic and social development. It is not only an important content of pedagogical macro-level research—the interaction and interchanging between education and economy, but also a key area of educational economics research—the value and the influence of education to industry.

In terms of the connotation and characteristics of the combination of industry and teaching, Klingstrom (1987) put forward that the integration of industry and education is a kind of personnel training mode which closely links educational activities with social productive activities. Jon Whittle & John Hutchinson (2011) holds that there are three relationships between education and social development: the combination of education and the developing trend of the whole society, the interdependence between vocational colleges and industrial sectors, and the interdependence between vocational colleges and their own development. As far as the connotation of integration of production and education is concerned, there is no basic consensus yet. Zhou Jingsong (2010), Yang Shan Jiang (2014) thinks that "production and education" has two meanings. The first refers to the industry (industry enterprises) and education (mainly college education), which involves the college-running ideas and system construction of vocational education; the second refers to "production and teaching", focusing on the teaching mode and methods of Vocational education.

Cao Dan (2015) believes that the integration of industry and education is different from the
college-enterprise cooperation. The integration of industry and education is a process of two-way development and integration of enterprises and colleges for their respective development. But the college-enterprise cooperation is a unilateral process in which colleges and universities actively seek to unite with enterprises in order to achieve the goal of talent cultivation.

The significance and value of integration of production and education is lying in promoting the interactive development of education and economy. In terms of the characteristics of the integration of industry and education, cross-border, mutual benefit, cooperation and complexity are the main characteristics of the integration of industry and education. In view of the content and requirements of the integration of education and production, most researchers agree with the idea of "five docking": professional setting butt-joint industrial demand, curriculum content butt-joint professional standards, teaching process butt-joint production process, diploma butt-joint vocational qualification certificate, vocational education butt-joint lifelong learning (Qin Bin 2014).

3.2 College-Enterprise Cooperation

The form of college-enterprise cooperative education originated from Germany at the end of the 19th century. Actually, it is a "dual system" in Germany which is called the beginning of college enterprise cooperation and began to prevail in developed countries such as Europe and America in the middle of twentieth Century. The term "college enterprise cooperation education" first appeared in the early twentieth Century in the United States. The names of college-enterprise cooperation vary from country to country, such as cooperative education in the United States, dual education in Germany, sandwich system in Britain and industry-college cooperation in Japan. Although the appellations are different, in essence, the fundamental reason for college-enterprise cooperation in various countries is to adapt to the rapid economic and social development and the demand for new professional and technical personnel.

There are two types of successful college-enterprise cooperation in Vocational Education in developed countries: one is mainly relying on financial input to promote vocational colleges to meet the needs of enterprises, such as Australia's "TAFE" education; the other is the direct participation of enterprises in vocational education, such as Germany's "dual system" vocational education. As a successful model of college-enterprise cooperation in developed countries, the "dual system" in Germany has aroused many scholars to study it. Enterprises' participation in vocational education is mainly manifested in two forms: financial aid to vocational education and providing training posts. While participating in Vocational education, enterprises benefit from apprenticeship by saving manpower cost and induction training cost.

In the 1970s, the German Committee of Experts on Cost and Finance first conducted a survey on the cost and subsidy of vocational education. The survey found that apprentices had more advantages than labor cost savings, such as the apprentices trained by enterprises themselves mastering the knowledge of enterprise characteristics, identifying with enterprise culture and receiving training ability which is sufficient to meet the special requirements of the enterprise; employing self-trained staff suffers less misplacement risk than recruiting staff from the mobile market; especially to prevent the occurrence of absence costs, especially in the case of insufficient labor.

3.3 Modern Craftsmen

Craftsmen, as an important group in the historical development of China, have an important historical position. Work, "Shuo Wen Jie Zi": skill, skillful decoration. The oracle bone inscription is a "Ding" shape and a circle at the same time. The original meaning of the word is the transformation of ancient iron, which describes ancient craftsmen's skillful craftsmanship. Craftsman means carpenter. From the etymological analysis of work and craftsmen, it can be seen that craftsmen have skillful craftsmanship skills and take it as a concept of labor occupation.

Ancient Chinese craftsmen were mainly engaged in the manufacture of utensils, most of which were required by officials. Some craftsmen not only possess technical expertise, but also have certain artistic design ability. A craftsman is a laborer who has a certain skill and is engaged in
traditional handicraft. According to the level of craftsmen's own skills, it can be divided into different levels; the most common is the "hundred workers", widely distributed in all sectors of society, then is the "blacksmiths" and other craftsmen with higher professional skills; finally, outstanding craftsmen. There are three technical characteristics of traditional craftsmen: it is mainly manual, hereditary inherited and family managed and its technological development is closed.

Along with the social development and progress, human life has gradually entered the era of industrialization and informationization. Driven by science and technology, human beings have stepped into the industrial society from the agricultural society. In the modern industrial civilization, the craftsman spirit, as an important component, has shown a wealth connotation.

Mentioning the craftsman spirit, Zhang Wencai concluded that: it is the spirit of strives for perfection, meticulous manufacturing spirit, pioneering spirit of creativity, the practice spirit of unity of knowledge and action, the service spirit of customer first, teamwork spirit, love and dedicate for the job.

4. Current Situation of Personnel Training in Higher Vocational Colleges

The current situation of college enterprise cooperation mode in higher vocational colleges should be analyzed from three aspects.

4.1 Set up a Training Base in or out of the Campus

At present, higher vocational colleges will find the suitable counterpart enterprises which are willing to jointly establish the internship and training base inside and outside the college, according to colleges' own curriculum arrangement and actual situation. On the one hand, students' actual working state of workers can be stimulated in the process of practice training. In the process of practice training, students can simulate the actual working status of workers to fully understand the work situation in enterprise and society and further improve their practical ability and hands-on ability. On the other hand, enterprises can also fully understand the work of students in the training base, and pick out outstanding technical and technical personnel for the enterprise, preparing for the subsequent recruit activity.

4.2 Set up Order Training Mode Cooperating with Enterprise

Order training, or "order class", means that large enterprises select proper students who is suitable and loving working in advance, and form a specific class. After the enterprise has selected the order training class, the school will revise the teaching plan and change related requirement for these students in this special order class, organize the teaching activity according to the enterprise's talent training objectives and related requirements. When graduating from college, the students finish their order training process. By this way, the students in college will study professional knowledge and improve and elevate their mind, and acquire the actual hand-on ability by studying following the master in the enterprise at the same time. So, through order training mode to cultivate students in college, the students can find job directly after graduation. By this way, students no longer face the pressure of choosing a job and employment, and students can operate equipment directly after entering the enterprise. For the enterprise part, they can also save the step of staff pre-job skills training which save time and running cost even improve efficiency of enterprise operation.

However, the above operation is the ideal; actually the implementation of the order class is not perfect. Many students change their job and will not work for the former company, leading to more unilateral breach of contract.

It is a common phenomenon that school-enterprise cooperative enterprises are not attractive to students. Students think that training is only an experience rather than a job in the future.

4.3 Set up Enterprise on Campus

The traditional "college factory" is to build the factory in the campus. By this way it can not only solve the safety problem of students' practice, solve the problem of insufficient space for enterprises,
and improve students' technical skills at the same time to achieve the sharing of resources between enterprises and colleges. It is a typical mode of combining production, learning and research. However, the mechanism of college-factory cooperation is not perfect, which leads to the low utilization rate of students' practice in college-factory.

4.4 The Realistic Predicament of Training Skilled Talents: Modern Craftsmen

First of all, influenced by our long-term educational concept, the recognition of craftsmen and modern craftsmen is not high. Traditional thinking is that: knowledge is superior to skills, and higher education and higher diploma are still in a high position. Everything is inferior, only intellectuals are the most superior. Such old education consciousness makes it difficult for vocational education to improve to a certain extent.

Secondly, in the current social situation of our country, the modern craftsmen represented by skilled workers have lower social status and cannot get high income. The development channels of craftsmen themselves are narrow, the opportunities for career promotion are limited, and the realistic dilemma of the growth and development of craftsmen themselves affects the recognition of the value of craftsmen's spirit in society. To a certain extent, it leads to the lack and deficiency of craftsman spirit in the training of technical and technical talents in higher vocational colleges.

Finally, in the practice of higher vocational education development, due to lacking of management experience, the limited investment in funds, the short time of running a school, the shortage of students enrollment, and other adverse factors, many higher vocational colleges focus on the mode of development of traditional colleges and practical experience of college students, in aspects of professional design planning and skills training process.

So, it is difficult to effectively cultivate skilled personnel with craftsman spirit in the practice, resulting in the dilemma of students' own neither complete knowledge structure nor skilled vocational skills. It is failing to achieve the goal of training high-quality skilled personnel in higher vocational colleges.

The cultivation of modern craftsmen needs a long time; need students acquiring possess certain comprehensive qualities in advance. It is crucial for students to be full of love and respect for the work which they will take. Students should accept a more comprehensive vocational education and quality education to make clear their future career developing.

At present, the quality of enrolling students in higher vocational colleges is not good, which leads that many students do not have good learning habits and lack of certain goal of struggle to some extent. At the same time, vocational ability of college students is lower, which is also the practical dilemma in cultivation of skilled talents in Higher Vocational colleges.

5. How to Cultivate the Modern Craftsmen

Person in charge of enterprise realize that the absence of technical personnel training will seriously restrict the vitality and sustainable development of enterprise production and operation. Therefore, only with the combination of production and teaching, college-enterprise cooperation outstanding modern craftsmen can be cultivated. The author wills analyze from the follow four aspects.

5.1 Implementation of College-Enterprise Joint Recruitment System.

On the basis of signing the Agreement on Cooperation between Schools and Enterprises, schools should enroll students first. In a strong professional and cultural environment, after anticipating enough lively professional lectures, the college students can be stimulated to choose a professional career counterpart their major.

Subsequently, according to the employer's needs and personal wishes, students are selected to participate in the "modern apprenticeship" training program. The students involved in the program sign an Apprenticeship Agreement with the enterprise on study allowance, work injury insurance, teacher qualification and other aspects. They also should sign College Training Agreement, including study time and content, scholarship and items about graduation, so as to establish and ensure the students' double identity and related rights.
5.2 Deepening Personnel Training of School Enterprise Integration

Colleges and enterprises jointly investigate and sort out the knowledge, skills and professional qualities required by domestic and foreign industries and enterprises, integrating vocational qualification standards with the relevant content of enterprise staff training and grading, thus forming the College-Enterprise Integrated Personnel Training Program and developing the College Teaching Standards and Enterprise Teaching Standards. On this basis, three courses, college courses, enterprise courses and joint courses completed by both college and enterprises, are set up. For the implementation of curriculum teaching, both colleges and enterprises have their respective resource advantages and feasibility, the best division of teaching content, time, space and teachers can be achieved.

The college and enterprise have also established a series of standards, such as employment standards of full-time and part-time teacher, apprenticeship selection standards, and other standards to make sure that students are in the enterprise rotation and on-the-job training practice. It is becoming a planned, targeted, experience-building teaching process with guidance, repeated skills training, which can effectively eliminate disjointing between students’ work and study and can avoid let students become cheap laborer.

The whole process of joint training is not a simple "2 + 1" model, but in every academic year the college students are arranged alternatively in two places, college and enterprise, in order to increase their working time in the enterprise with the grade’s change. Throughout the whole process of training, Cultural immersion and teach by precept and example are persisted to cultivate the great craftsmen's "excellence" quality and temperament.

5.3 Rational Allocation and Development of Teaching Resources

In order to strengthen the systematization and comprehensiveness of enterprise education, a school-enterprise cooperation office and a full-time management coordinator should be set up in the human resources department of the enterprise. In addition, the enterprise should equip full time management coordinator, master in teaching crafts, and arranges suitable practice post to train. For the students' rotation training and post-practice, the enterprises all choose teachers who are above technician to carry out teaching projects according Enterprise Teaching Standards.

In order to ensure the continuity and complementarity of school teaching and enterprise teaching, the enterprise should put part of production equipment to the college, assigns managers and technical backbone resident colleges, cooperate with professional teacher in college to accomplish the related teaching task, and coordinate alternate teaching. The college will build a productive training base with a strong corporate culture atmosphere in the campus, so that students can deepen their ardently love for their careers in the environment where they can see and hear everywhere. College and enterprises should jointly develop professional teaching resources database to enrich teaching resources.

5.4 Innovate Personnel Training Assessment Mode

How to assess the effect of talent training in vocational college, the standard examines should be arranged, such as the mid-term exam and the teacher's examination, which are set up by related enterprises, to evaluate the comprehensive vocational ability of the apprentice. The students should obtain the corresponding vocational intermediate qualification certificate, and then they can take mid-term examination at the end of the fourth semester. In addition, in order to improve students’ practicing capacity, if the apprentices get the corresponding Senior Workers certificate, and they are qualified to take the exam which means they finish their apprenticeship. In above exams, if the students have good or perfect performance, they can sign letter of intent with the enterprise where they worked for in the long period, and they can the treatment of employees. The students and the enterprise can choose each other by their own wish.
6. Conclusion

Through the implementation of "Modern Apprenticeship", the author realizes that cultivating modern craftsmen has a long way to go. In the modern society, the superb craftsmanship relying on the skilled experience should carry forward by the hands-on interaction between master and apprentice, face to face. With the development of modern industry and science and technology, "Traditional Apprenticeship" training mode need cultivate high-skilled personnel meeting the requirements of contemporary technological and technological development. All this based on incorporating college education in apprenticeship training process. When the master teaches craftsmanship, they also conveyed the spirit of patience, dedication and adherence, which are essential characteristics of all craftsmen.

To train modern craftsmen, the following points should be taking into consideration:

The college and enterprises are the main body of running college; students are both students and apprentices (prospective employees of enterprises); students have professional teacher and outstanding master from the enterprise; college should own learning base and off-campus training base; after accomplishing studies, the academic evaluation comes from the comprehensive evaluation of professional teachers in college and master in company.

In the processing of training modern craftsmen, the enterprise should sign the agreement between the college and the enterprise, between the student and the college, between the student and the enterprise; the college and the enterprise should formulate corporately the teaching standard, the teacher employment standard, the apprenticeship selection standard, the apprenticeship treatment standard, the training base construction standard, the mid-term and the teacher-leaving examination standard, etc.; the enterprise should determine the enterprise master according to the training direction of apprentice and the post which is decided by the training direction and the characteristics of apprentices.

At the aspects of the college running system, the training of modern craftsmen must base on school-enterprise cooperation; at the aspects of the operational mechanism, the training of modern craftsmen must base on industry teaching combination; at the aspects of teaching organization, working and studying must be combined each other.

"Modern Apprenticeship" can be said to be an effective carrier for Vocational Colleges and enterprises to realize school-enterprise cooperation, integration of industry and education and integration of work and study.

Through "modern apprenticeship" talent training, only the enterprise actually benefit from its fruit, can college-enterprise cooperation be carried out continuously, and then more modern craftsmen with high quality and superb craftsmanship will be brought up.

In conclusion, cultivation modern craftsmen have a long way to go. This article researches and explores the training of modern craftsmen under the combination of production and teaching and college enterprise cooperation. Based on the perspective of craftsmanship, this paper investigates and analyzes the practical plight of the cultivation of skilled talents in higher vocational colleges and the influencing factors, providing some useful ideas for the cultivation of skilled talents and the study of craftsmanship in higher vocational colleges. The research on the cultivation of skilled talents in higher vocational colleges from the perspective of craftsman spirit has certain practical significance and theoretical value. Due to the limitations of the author's own research level, there are still some shortcomings in this study.

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Reference


