

Practice and Reflection on the Apprentice Training Talents “Dual Systems Four Stages of Work Integrated Learning” Education Approach

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Abstract: In view of the current demand for skilled talents required by the Chinese construction industry, this paper takes the Jiuzhou Polytechnic of Xuzhou, Jiangsu Province as an example and puts forward the apprenticeship training model of “dual system, four stages of work integrated learning,” with the characteristics of vocational education from China Jiuzhou Polytechnic along with its paid study courses.

Keywords: *skill type; dual systems four-stages; apprenticeship; training approach; practice*

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0 Introduction

Currently, Chinese influence continues to grow in its continuous transformation and overall upgrading from its construction enterprises. Its development tendency has become increasingly prominent in the requirements and demands of vocational, skill-oriented talents. The Ministry of Human Resources and Social Affairs and the Ministry of Finance introduced (Opinions on the full implementation of the new apprenticeship system of the industries) on October 12, 2018-No. 66^[1], puts forward specific guidance on the modern apprenticeship system of “work integrated learning”, and for the first time clarified the specific tasks relevant to functional departments, employers, higher vocational colleges, etc. which has provided a strong boost in the promotion of the apprenticeship talent training program.

Currently, many experts have also carried out related research. Zhihua^[2] of Hunan High-speed

Railway Institute believes that “apprenticeship is a very practical form of education, achieving the cooperation between teachers and instructors, and is able to bring the domestic vocational education to a higher level.” Professor Zhiqun^[3], a director of the Chinese Vocational Education Council, believes that the modern apprenticeship system can reduce structural unemployment, promote the employment of disadvantaged youth, and achieve a higher degree of school-industry cooperation.

Jiuzhou polytechnic is a private higher vocational college. Although it has formed a set of talent training methods in its long-term teaching practice, it still has some certain gap from the industry’s requirements. After many researches and investigations with the relevant industry, it finally adopts the modern apprentice talent training model of “dual system-four stages of work integrated learning.”

1 The connotation of the apprentice-type training model of “dual system, four stages of work integrated learning” education model

1.1 The connotation of the “dual system, four stages”

1.1.1 The origin of the “dual system”

The so-called “dual system” is based on the German’s dual system “dual vocational education and training” talent training model. The so-called “dual subjects” are the joint cultivation of two subjects from the enterprise and college.

The “dual system” education is a magic weapon for the rise of the German economy after the World

War II. The German government attributed the rise of its economy to their unique vocational education system. The success of the German “dual system” vocational education has been recognized and studied by many countries around the world. To promote the development of China’s vocational education, in 2007, Sino-German cooperation opened its first batch of vocational college teacher training. Professor Song Gongye, current director of the Department of Civil Engineering of Jiuzhou Polytechnic, was one of the trainees sent to Germany at that time. Dayuan^[4], a researcher at the Vocational Education Center of the Ministry of Education, believes that “the Dual System is the best preparation for employment and is a cornerstone of the economy.” The dual system has truly achieved the goal of coeducation from college and enterprise.

1.1.2 The connotation of the dual system

Based on its actual situation, Jiuzhou Polytechnic adopts the “dual system, four stages” mode. “Dual system” here refers to a “educational subject” co-funded by the college and the long-term cooperated companies that are striving to achieve a win-win situation for both entities. According to this idea, “Jingming Class” [Figure 1] was founded together with Jingming Decoration Design Co., Ltd. (according to No. 34 document of Jiangsu Provincial Education Department 16 Su Shijiao, the company is an apprenticeship pilot company), and “Chinese-German Class” [Figure 2] was founded together with Jiangsu Tiandao Roofing Building Materials Technology Co., Ltd. (some apprentices go to Germany for further study) and other “dual systems, four stages of work integrated learning” apprenticeship talent training approach pilot classes was founded.

1.1.3 The meaning of “four stages”

The above “four stages” refer to divide the 3-year system of general vocational education into four stages of $3=0.75+0.75+1+0.5$ school years. Among them, the first stage refers to students study at school for the basic skills and basic knowledge that are necessary for construction site; the second stage means the cognitive and practice stage. Students at this stage are required to conduct actual production learning at designated enterprises to perceive better understanding of the enterprise and the job position, and some students may even master some means of making a living through

the first two periods of stage; the third stage requires students to return to school. After the first two stages of the study, most students are able to further reinforce their knowledge and skills required for personal career development by selecting the appropriate courses. The fourth stage is the stage of internship and traineeship, which will help students to get ready for graduation and employment. Such an example could be found in the profession of Construction Engineering, as shown in Figure 3.

1.2 Detailed description of the four stages

1.2.1 The first stage (0.75 school year)

At this stage, students in the school are first required to acquire basic vocational skills training which are necessary for the construction industry such as Architectural Recognition Graph, CAD Drawing, Engineering Survey, Building Materials Testing,



Figure 1. 2018.9.12 “Jingming class” starts



Figure 2. Mr. Guido, a German expert from Tiandao Company, teaches “Sino-German class”

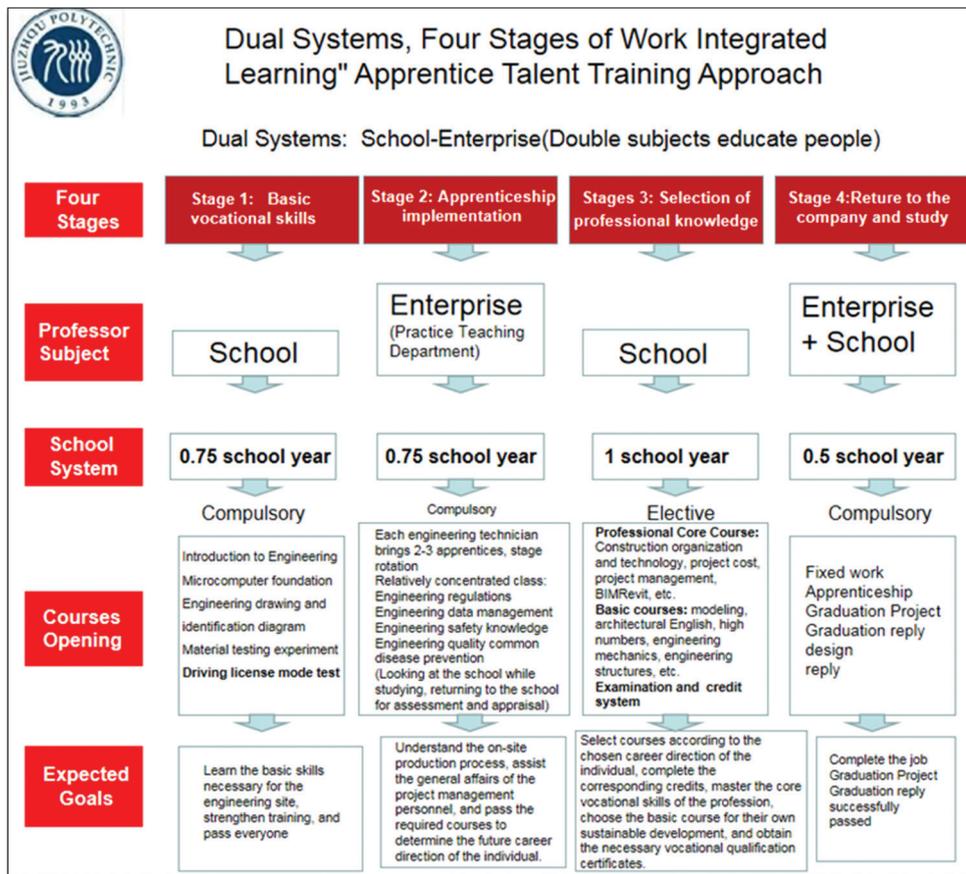


Figure 3. “Dual system, four stages of work integrated learning” apprentice talent training approach

Computer Processing, and other basic skills. These vocational skills will then be assessed on a one-by-one basis similar to driver license test. This would allow the apprentice to be better prepared before venturing into the job posting assigned in the second stage.

1.2.2 The second stage (0.75 school year)

This stage is the practical stage of the apprenticeship of work integrated learning. The relevant management department of the college will arrange the acceptance of apprenticeship with relevant enterprises, mobilize the task, and then send students to the front line of enterprises’ production line for “apprenticeship” learning. At the same time, our team members will conduct regular visits and surveys to these enterprises and apprentices [Figures 4-6 and Table 1]. At this stage, the first-line instructors of the project use the method of “passing the band” to teach these apprentices, including “passing the technology, passing the management, and passing the experience.” Apprentices could basically play the role of “junior technicians.” Based on the foundation from the first stage, apprentices are able to do some basic project work and gradually improve their

professional level to help resolving various production problems. This stage is the most crucial stage, plays the core part in the cultivation of apprenticeship talents of the “dual system, four-stages of work integrated learning” approach, and is also an important stage for students to obtain the so-called “invisible knowledge” as said by the British philosopher Polanyi.

This stage also has the characteristics that the relevant enterprises’ management personnel and colleges together set up production-oriented engineering courses coordinated by production and teaching, such as Engineering Materials Management, Building Regulations, Construction Safety, and Common Failings of Engineering Quality. In addition, with the presence of instructors in the front line of the construction site, this is also an effective way for colleges to improve the quality of “dual teacher” system.

The company is “Xuzhou China Resources Property” listed in Table 1.

1.2.3 The third stage (1 school year)

Apprentices return to school to complete their professional knowledge through verification and relearning. Professional core courses and relevant



Figure 4. 2018.4 dean of Du Shubin, Jiuzhou polytechnic, mobilization meeting of enterprise apprenticeship activity



Figure 5. Author (first from the right) 2018.11.09, year 2017 “apprentices” were posted to Nantong Sanjian Xuzhou Engineering Project Department



Figure 6. The author (first from the right) and Prof. Gongye Song (third from the right) 2018.10.29 revisit apprentices

selective courses are offered in this stage, which include Professional English, Advanced Mathematics,

Engineering Structure, Engineering Mechanics, Construction Organization and Technology, Engineering Cost, Project Management, and BIM modeling. The feature of implementation during this stage is that all students are free to choose their courses, and they need only to obtain the required credits. In addition, students in this stage can also obtain relevant certificates on their own needs.

1.2.4 The fourth stage (0.5 school year)

Students will return to their respective job posts and continue their apprenticeship. Apprentices from this stage will eventually graduate after returning to college to finish their graduation design and debation.

The above-mentioned “work integrated learning” implementation method can be divided into four teaching stages, which are carried out in the form of “college→enterprise→college→enterprise,” so that students can rotate by learning in college and being apprentices in enterprise. Colleges and enterprises take their respective responsibilities and perform their respective duties so that they can achieve the purpose of “dual system” education and also they can fulfill the education ideology of the connection between theory and practice.

2 Characteristics of the apprenticeship training model “dual system, four stages of work integrated learning”

Under the current system and mechanism of our country, the key point of the implementation of the “dual system, four stages” is the implementation of responsibility, right, and interest. Without well-defined responsibility, there will be prevarication of work; without right, there will be no management; and without interest, there will be no enthusiasm and drive to work.

2.1 Responsibilities for “dual system, four stages of work integrated learning”

2.1.1 Dual system dual responsibility

The “dual system” is adapted from Germany experience. However, under our current situation, we have not yet achieved the perfect education system as Germans.

To this end, we have explored a special model to suit Jiuzhou Polytechnic, that is, under the instruction and the goal of cultivating skilled talents, colleges and enterprises are seamlessly formed into one community

Table 1. Name list and geography of construction enterprises that received year 2017 apprentices

List of JiuZhou college construction receiving apprenticeships and their respective regional distribution						
Number	Apprentice list	Project location	Project contact	Area	Names of the companies	
4	Shipeng Zeng, Kelliang LV, Huan Wu, He Li	Xuzhou and surrounding areas	General manager Chen	Jiangsu Subei Xuzhou and surrounding areas	Nanjing Firs Construction Office Co., Ltd. Xuzhou Branch	
2	Lalshuang Wang, Zhlehuar Shi	Xuzhou China resources	Manager Chen		China Resources Land Xuzhou Oak Bay Protect	
6	Jiling Li, Dapeng Zheng, Jingzhong Yang, Zhenyang Mao, Yutin Ni, Weifeng Yuan	Xuzhou Jiawang	General Manager Shi		Zhejiang Wanda construction project	
6	Bo Kang, Gang Long, Chenglei Cai, Zixing Ye, Shuai Cao, Xitong Yan	Xuzhou and surrounding areas	General Manager Wang		Jiangsu Nantong Sanjian Xuzhou Branch	
4	Jun Tang, Yue Sun, Hong Li, Zhiyong Sun	Shandong Zoucheng	Manager Du		Zhejiang Xiangsheng Real Estate Development Co., Ltd.	
3	Yang Liu, Bing Xiang, Baosheng Li	Around Kunshan	Manager Chen	Jiangsu area	Kunshan Yingtong File Management Service Co., Ltd.	
6	Yuehui Sun, Yingying Ao, Bing Liu, Wenjie Jiang, Anzhou Wang, Yuling Tang	Kunshan City	Manager Gao		Jiangsu Rongwei Project Management Service Co., Ltd.	
1	Yaolan Dong	Kunshan City	Manager Zhang		Kunshan Chuangyi File Management Service Co., Ltd.	
12	Chen Li, Wei Jiang, Peng Huang, Yue Gu, Hengying Lu, Dong Zhang, Jinli Lv, Yingfu Chen, Qiaoqiao Tian, Xing hang Xu, Jianguo zhu, Yuxin Guo	Suzhou Wuxi Changzhou Zhenjiang	Manager Cheng		Suzhou Gongming Construction Supervision Co., Ltd.	
9	Qinyuan Qien, Junjie Wang, Zewen Xu, Tao Qin, Haibao Hu, Huangdong Luo, Chao Jie, Mingyue Zhang, Baisheng Wei	Zhejiang Jinhua	Manager Zhang	Zhejiang Province	Zhejiang Guanghong Construction Co., Ltd.	

Actual number of class: 58; Number of interns allocated: 53; Self-seeking enterprises: 5; Yuhang Zhang, Rul Vang, Jianqiu Gui, Weifeng An, Tianyi Chen

by means of mechanism, to finish the common goal of skilled talent cultivation. For example, we have clearly stated in our contract for our “Jingming Class” which is cooperated with Jingming Decoration and Design Co., Ltd. that both parties will jointly enroll and educate our students. During the college study stage, Jiuzhou Polytechnic will be the main body, with Jingming Decoration and Design Co., Ltd. as a subsidiary role, Jiuzhou polytechnic will be responsible for all activities of students, including their safety. During the off-campus study stage, it will be the other way around, the enterprise will assign instructors who are responsible for teaching (every 1–3 students will be equipped with one enterprise instructor), and the enterprise will be responsible for students meals and accommodation, as well as providing students with certain amount of living expenses.

The knowledge and skills learned by “apprentices” trained in this way are consistent with the demands of production, which will ease the urgent needs for skilled talents by construction industries.

2.1.2 Dual resource dual teaching

The implementation of this education approach will inevitably involve relevant teachers from colleges and staffs from enterprises. The teaching resources of the two parties are of high quality and have different strengths. According to different stages of development, they can undertake different courses and achieve a win-win situation.

2.1.3 Student apprentice dual identity

Due to the “apprenticeship” study in the second stage of the model, students have basically defined their future career goals and related courses. Therefore, after returning to school in the third stage, students will be free to choose relevant courses according to their individual career goals, which is also a good indication of the student’s dominant position in teaching. Due to the goals and motivation, it will greatly improve students’ enthusiasm for learning and initiative, hence avoiding embarrassing situations in which students play mobile phones during class.

2.1.4 Learning and practice dual experience

In the second stage of the education approach, both apprentices and enterprise personnel will live and work together. In doing so, both the production procedure and professional environments will be observed by students,

and as such, the hardworking quality of the construction workers would be inherited by students. This will not only improve the professional level of students but also achieve the purpose of teaching and education.

2.1.5 Multiple parties responsible for students’ safety

The safety of apprentices during the job post is mainly guaranteed by on-the-job safety training and safety agreement, and in the meantime, multiple parties such as apprentices, enterprises, colleges, and parents will all execute their duties.

2.2 The distribution of rights in the “dual system, four stages of work integrated learning”

The key point is the distribution of management rights. During the school study period, Jiuzhou Polytechnic is the main management party; during the off-campus study period, enterprise is the main management party.

2.3 Multiple benefits of “dual system, four stage of work and study rotation”

Practice has proved that the implementation of “dual system, four stages of work and study rotation” is beneficial to students, parents, enterprises, and colleges.

2.3.1 Student benefits

Students are the biggest beneficiary of the implementation of “dual system four stages of work integrated learning” approach. Students are not only able to improve their skills, increase their knowledge, become more familiar with enterprises and jobs, but also able to increase their income, which is equivalent to a “paid-learning” treatment.

2.3.2 Parent benefit

Students with increased abilities allow them to successfully find a job and become self-sufficient, and their parents will be happy for them. At the same time, many impoverished families are able to reduce their financial burden due to the “paid-study” approach.

2.3.3 Enterprise benefits

Hardworking apprentices in enterprise can quickly become full-time worker after internship, therefore creating wealth for enterprises, which will be much welcomed by enterprises.

2.3.4 College benefits

Through the implementation of the new education approach, colleges have tightened their connection with enterprises, which also increased their reputation. Through revisits to internship, colleges will get more understanding of enterprises' demand, making the implementation of the curriculum reform more focused.

3 Continuous improvements on the apprenticeship training approach - "dual system, four stages work integrated learning"

The apprenticeship training approach - "dual system, four stages of work integrated learning" - is currently piloted in the class of the year 2017 with 58 students from profession of Construction and Engineering Technology, Jiuzhou Vocational and Technical College, and is in the middle of the second stage. The effect is quite good, but during the implementation, we found that there are still some weak points such as students' lack of understanding of basic theories, as well as the absence of systematic guidance.

3.1 Poor comprehension of the basic theories by the students

Being apprentices in enterprises and receiving step by step guidance from instructors, students still face a great challenge of self-studying due to the lack of systematical foundation learning. Some apprentices still face difficulties in understanding the relevant theories and skills taught by instructors. Moreover, the complexity of engineering work and fast pace will increase difficulties of their self-study. In addition, the low level of apprentices' cognition ability will create confusion in terms of their identity, rights, and career prospects.

3.2 Unsystematic and uneven on-site guidance

Although the enterprises' instructors can teach apprentices on-site skills and experience, they generally have additional work of their own in regard to engineering projects, and thus, it is difficult to guarantee a systematical and complete instruction. In addition, instructors' own expertise and experience vary from each other, which also affect the guidance and influence to apprentices.

3.3 Difficulty in monitoring off-campus apprenticeships

As apprentices receive training at front lines in various enterprises, colleges could not be able to acquire the first-hand information of their apprenticeship, they normally have to pay some regional visit due to lack of monitoring force, which always has its limitations. Enterprises are still lack of evaluation system due to some special reasons, even if they do have the system, it still has not been implemented, which brings uncertainty to the successful implementation of apprenticeship training.

4 Conclusion

At present, the apprenticeship system is still in its pilot stage, with the government and colleges being the initiators and promoters. Moreover, there is little relevant experience in China that can be used as references and that the relevant legal guarantee regulation is still pretty much non-existent. Due to the traditional social environment, even if some specific measures are formulated, they are still in their idle states. Qifu^[5] believed that "the pilot apprentices in higher vocational colleges lack both the necessary legal basis and basic operational regulations. Effective promotion of such an education approach still faces great difficulty."

Currently, the implementation of the apprenticeship training "dual systems, four stages of work integrated learning" education approach still faces various issues which need continuous improvement and optimization of layout. First of all, it is urgent for the state to introduce effective laws on apprenticeships so as to protect the rights and interests of all parties involved in this education approach. Colleges and enterprises should jointly establish an apprentice evaluation system, as well as a remote information management platform, and strengthen the tracking and quality assessment of apprentices. The government should take the responsibility to timely solve issues from enterprises and colleges should solve the issues from apprentices. At the same time, the enterprises involved should enhance their sense of social responsibility and industry development mission.

Only with the strong support of national policy and the spirit of Chinese innovation, the "dual system, four stages of work integrated learning"

apprenticeship-oriented vocational education approach can be well established as the forefront of our education system and eventually will be well-known domestically and abroad.

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