The Applied Talents Training Mode of Trinity and Its Practice

Zhou Xitang / 1st
Faculty of Chemical and Environmental Engineering
Guangdong University of Petrochemical Technology
Maoming 525000, China
e-mail: zhou-xt@hotmail.com

Li Run/ 2nd
Faculty of Language and Law
Guangdong University of Petrochemical Technology
Maoming 525000, China
e-mail:lirun516@163.com

Xuan Zhengnan
Faculty of Mechanical and Electrical
Guangdong University of Petrochemical Technology
Maoming 525000, China

Guan Zhiqiang
Faculty of Food Engineering
Guangdong Ocean University
Zhanjiang, 524000, China

***Abstract*—The applied talents training mode of trinity was presented on the basis of analyzing the experience of reform about the applied talents training in recent years. The basic situation of applied talents training in our university is made known by three trinities based on cultural object, system and process respectively. And the three trinities will point the future direction of our reform clearly.**

Keywords-applied talents; training mode; practice

I.INTRODUCTION

Applied talents are the skills-based ones who can use the mature technology and theory to solve practical problems in the production and living[1]. Talents mode is the template, example, and style of personnel training. In the next decade, the reforms of higher education in China are to renew the concepts of personnel training, to innovative the training mode and to reform the systems of education quality evaluation and personnel evaluation[2]. It was required by the talents training pilot program of Guangdong government that the personality development of students must be taken as the core, the innovation and entrepreneurship practice capacity of students must be the focus, the system of applied talents training must be perfected, the personnel training of institutional mechanisms must be reformed, the training model must be innovated, and those trained in colleges must be the high-quality talents who can adapt and promote the regional economic and social development. According to the minds of related national and provincial policies[3], considering the background of local college and the characteristics of petrochemical industry, the position and developmental goal of our university have been determined- to adjust and optimize the discipline structure and personnel training programs timely, to stress the training of applied talents for their adapting to the local economic restructuring and industrial upgrading[4].

The main approaches of our university in the discipline structure adjustment and optimization are to large and strong our engineering education, whose service objects are the pillar industries of the Pearl River Delta-petrochemical, machinery, electronics and information technology[5], to fine the teacher education that serves the local primary and secondary schools, and to develop science, economy, management, legal and arts education properly, which form the subject base and playing support role. In this vein the discipline system of industry education-chemical engineering and technology, control science and technology, power engineering and engineering thermodynamics, environmental science and engineering- has been constructed in our university.

II.THE FIRST TRINITY

Based on the training objectives, the first trinity consists of reconstruction of the knowledge system, development of the professional skills and improvement of the overall quality. With the development of the modern science, especially that of information science, knowledge accumulated by the human is growing exponentially. To various disciplines which and to what extent of the knowledge should be teach to the students has become a great problem. It must be focused on ‘explanation of doubts’ for teachers to train the students effectively, that is they must suit to the change from giving students knowledge to teaching them how to obtain knowledge. To train the applied talents is the first and the most important mission of local college, so the relationship between knowledge transfer, skills training and quality culturing should be handled dialectically.

A. Reconstruction of the knowledge system

The knowledge system is a carrier of the capacity-building and quality education. For a modern professional to possess a reasonable knowledge system is undoubtedly important and fundamental because it related to the culture of his professional skills and the overall quality. However it is an extremely complex question to answer what the reasonable knowledge system is. It is thought that the training objectives of a college determine the knowledge system that be taught to the students[6]. For example, knowledge demanded by academic talents is different from that done by professional ones. As for engineering students in an ordinary local college, Enming Hu thought their knowledge should include the instrumental knowledge,

humanities and social science knowledge, natural science knowledge, economic and management knowledge, and knowledge of engineering, technique and expertise. We think to the professional education in a local college knowledge transfer should depend on the demand of the future profession, that is the knowledge system should be constructed based on the professional learning, not be too broad and too deep. This is actually a correction of too much emphasis on the integrity of the subject knowledge.

B.Implement the professional skills training

Professional education is different from disciplinary or academic education either in the knowledge system or in the demand to skills training. Since professional education emphasizes on applied, technical and high-skilled elements, in the process of formulating and implementing the personnel training program, it must be focused on learning time, learning aspects and condition construction. It is all known that professional skills learning can achieve by training internal and external college. However, in present China training of undergraduates has not been included in the performance evaluation of enterprises. Some of them are reluctant to accept students practice in their workshop, which makes the practice difficult to implement.

According to the Programs of Excellent Engineer Education and Training, China will promulgate related preferential policies to encourage enterprises participating personnel training, and to achieve win-win in the cooperation between enterprises and colleges. That is enterprises give colleges support in personnel training and the latter recommend the best graduates to the former.

In our university, professional skills training achieves by school training, such as metalworking practice and pump disassembly, and off-campus internship, such as post practice and pre-job training. In accordance with the requirements of the 'Programs of Excellent', students who join the pilot of 'Programs of Excellent' must learn in enterprises for a year cumulatively. In fact to strengthen the practice of education is by no means new idea. The key is how to complement the plan of professional training.

C.Improvement of overall quality by multi collaboration

Quality is an inherent thing developed by way of individual understanding and practice while he obtains knowledge and skills from the outside world. The overall quality consists of professional and non-professional quality, the former include professional knowledge and professional skills and the latter include moral, physical and mental qualities, cultural qualities, artistic accomplishment, interpersonal skills, leadership, organizational ability and international perspective, etc. Professional training has always taken seriously for it is, after all, the fundamental of professional education. However, non-professional training should not be underestimated for it requires appropriate teaching, good environment and atmosphere. Non-professional training can achieve only by the cooperation from all departments in the college, and from school, family and the whole society, not by one or two isolated courses.

III.THE SECOND TRINITY

Based on the training system, the second trinity consists of theoretical teaching system, practice teaching system and the quality development system. In recent years, in China, because of the change of high education from the elite to the popular the student scale is growing and the constructions of the teachers and the practical education conditions are seriously lagging behind, which leads to the large class of theoretical teaching, the weakening of practical teaching and the softening of the quality education. It may be seen that the scale of China's higher education is larger and larger, however the quality of personnel training is not optimistic. In view of this it was pointed out while dealt with the higher education in the medium-and-long term national education reform and development plan that to improve the quality is the core task of the development of higher education and is the basic requirement of building the power of higher education. That is the growth of scale is no longer the development objectives of China's higher education.

To improve the quality of higher education, teachers and construction funds must be increased, first of all, colleges need to explore their potential, improve efficiency. So it is urgent to establish an application personnel training system with an advanced concept, a reasonable internal proportion and an effective implementation.

A.Theoretical teaching system

In China theoretical teaching classes in colleges account about 75% of the whole approximately, which illustrates that three-quarters of student's time and effort are spent on learning theoretical courses. So it is extremely important to improve the quality of theoretical teaching and to establish a course system that with reasonable structure and clear level. In our university, several public teaching platforms, including English, mathematics, physics, computer, engineering drawings, electrical and electronics, have been established in the past few years, besides that of the ideological and political courses. Each platform is divided into 2~3 levels according to the needs of different professional, and the academic hour of each level is determined jointly by the office of academic affairs and the corresponding teaching department, the content of each level and the internal time allocation are determined jointly by the professional department and the teaching one.

This approach is easy to the unified management and to the special requirements of the professional. As for the professional courses, most of them were restructured to different modules according to different directions. And the students select several modules according to their needs and interest. However at present, most of the professional teacher is not sufficient, some elective modules may also be opened every session. In some colleges, teachers invited from enterprises are the best in several areas of expertise and can make up the insufficient of college teacher.

B. Practical teaching system

Professional composition and professional nature determine the form diversity of practical teaching. In schools specialized experiments, research experiments and

specialized training are the main practical teaching, and out schools trainee, professional practice graduation practice and skills training are as well as the main. It decides the quality of our student's skills training, even the professional quality, to construct the practical teaching system scientifically. Since the group teaching practical teaching requires big investment. So for colleges the investment from the government is the main financial channel, and support from enterprises is another solution. In short practical teaching must be various forms and flexible.

C. Quality development sys tem

An excellent college must attach importance to the students' personality, expertise and hobbies, to streamline the educational content, to the comprehensive practical training, and to reform the examination system and assessment criteria, which will cultivate the students' innovative spirit. In the overall quality the professional is being paid attention and the non-professional is not. However after going into the society the students' future development will be decided by their overall quality. So it is also important to train the students' non-professional quality in college. Non-professional quality is not cultivated only by several courses but by a series of internal and external activities, such as student technology competition, campus cultural activities, community work, virtual or physical design and production line visit. Some public selective courses can also develop students' horizons, give them influences in scientific, cultural and arts, and make up the vacancies in the professional knowledge.

IV.THE THIRD TRINITY

Based on the training process, the third trinity consists of teaching methods, training mechanism and the quality monitoring and evaluation system. To train the high quality personnel requires operable program, reasonable and clear goals, scientific method, excellent mechanism and effective quality monitoring and evaluation system.

A.Teaching methods

In China the rapid development of higher education results in the reduction of per capita teaching resources, such as the growth of student-teacher ratio and the reduction of exchange between students and teachers, which influence the training quality. To correct this bias, some teachers proposed and carried out the 'Guidance' teaching method [7], that is, from the course content to the research project, each teacher guides several to several dozen students for research study. The advantage of this approach is that the students' initiative can be stimulated. They can learn to combine the fragmented knowledge organically to understand and solve some specific problems. Moreover, several other teaching methods, such as inquiry-based and case approach, are all effective so long as teachers used them properly.

B.Training mechanism

Cooperation in personnel training between colleges and enterprises has changed from student internship to enterprise deeply involved in the college's personnel training, such as teachers go deep into enterprises to participate transformation, project development and production organizations, which can improve their ability of engineering practice. At the same time, enterprises participate the development of college personnel training program, technical personnel give lessons of technical courses, give guidance to students in internship training and in graduate design. Enterprises' staff training centers and job research system is open to students, and the college provides them with outstanding graduates, participate in their training of workers also. The above will update the training mechanism and create a win-win to colleges and enterprises.

C.Quality monitoring and evaluation system

Besides drawing up a scientific and reasonable professional personnel training program, there must be a set of quality monitoring and evaluation system to ensure the effective implementation of the program. Our approach is to improve the monitoring and controlling system on teaching quality, to develop the quality standards of such teaching sections as experiment, practice, graduate design, et.al., to inspect the teaching order from time to time, to evaluate the teaching quality periodically, and to feedback of the inspection and evaluation results timely. Several aspects, such as teaching quality, teaching schedule, teaching management, learning situation and logistical support, are monitored timely by teaching examination, teaching supervision and evaluation.

V.CONCLUSION

In this paper it is replied what applied talents are and what colleges must do to train applied talents. In a word, to train applied talents, colleges must clear a reasonable objective, construct a scientific training system, and form an innovative training mechanism. First of all, colleges must strengthen the practical teaching, attach importance to students' overall quality training. Only in this way many applied talents will be trained by our colleges.

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