Practicing on the Training Teaching of Applied Engineering Based on Qualification

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Abstract. Because of the inaccuracy of location, insufficiency of systematicness, weak faculty and unsatisfied effect, traditional applied engineering course can’t keep up with innovation trend of strengthening of personal qualification and future development in architectural field. Several existing problems in applied teaching are analyzed, based on studies of applied course teaching in Xichang college, practical teaching model guided by qualification is pointed for systematical teaching, clear target, promoting location, qualified faculty and active students. This practice proves that practical teaching based on qualification improves teaching effect, develops students’ executive ability and constructs foundations for coming high school transformation development.

Introduction

Architectural system of qualification is the established practice about the mutual recognition of professional qualifications and international market access. And for the public interest and the engineering quality and safety, it’s important to access control professional and technical work by the government. The reform direction of weaken engineering construction enterprise qualification and strengthening the personal qualification is very clear in the construction industry [1], it puts forward new requirements for the Applicative High Schools to train personnel.

Engineering practice is an attachment to the theoretical teaching or tending to vocational education for the zero distance employment in the traditional teaching, but ignored the fundamentality, a long-term, and fully functional of undergraduate education [2]. The traditional engineering practice bound the all-round development of students, restricted the student’s ability of practice, it’s hard to meet the needs of the industry in the future.

Traditional Training Is Difficult to Meet the Needs of the Application

Applied talents training should pay attention to students’ comprehensive qualities such as practice ability, innovation ability and entrepreneurial ability. It’s hard to arouse students’ enthusiasm in the traditional engineering practice because they are just copy teacher’s action. So many scholars have made a lot of research in practice teaching to the student [3~10]. Under the background of the Country guiding a group of undergraduate colleges and universities to transformation application type of institutions of higher learning, Traditional practice teaching has been difficult to meet the needs of the applied technology talents under the new situation.

The Positioning of the Practice Teaching Is Not Accurate

The traditional practice teaching was often as attached and extension of theoretical teaching, it also be obedient to the theoretical teaching in the process of training syllabus and the teaching plan compilation from. Many applied universities put the researching work first, followed in teaching theory, and the practice teaching last. There was imbalance between academic and technology, it made the practice teaching with theory teaching status have not obtained equality, and let alone on a par with science research. It was difficult to improve training quality because of the wrong orientation. The one of the performance was the training weeks in the talent training scheme had split or cut in the process of execution by the theory teaching.
Practice Teaching Lacks Continuity and Systemic

The traditional practice teaching were mostly used to supplement the theoretical teaching, of course it consolidated the theoretical teaching. The single course training such as CAD training, building materials training, was strengthen the students' theoretical basis and exercised the students' beginning ability. But dispersed training hard to improve the students’ knowledge structure, it was hard to use skillfully in the practical engineering for the students, because it ignore the coherence which should have in the engineering practice.

Engineering education to run by traditional engineering thinking, it made the lack in cross integration between engineering and other disciplines, which restricted the students the formation of a sound engineering consciousness and engineering concept. The traditional engineering training teaching pays attention to the training of production skills and construction technology, the students are required to master engineering construction technology and have a certain innovation spirit. At the same time, it weaken the training about the ability of organization, management and coordination which should have. How to assign the tasks, how to organize and coordinate the mission and how to provide logistical support, that’s very important but been ignored in the traditional training. In the practical training of structural, the requirement is how to make the structure satisfy only, but the appearance and human factors engineering been ignored. The training of traditional was decentralized, was not a coherent and systematic.

The Result of Training Is Impossible to Quantify

The students didn't know that training will improve their ability to work or not. They didn’t judge the goals, nor is it clear training should achieve what standards to meet the needs of the practical work. The traditional training unable to mobilize students' initiative and enthusiasm because of the result of it is impossible to quantify. Some colleges established the monitoring system about the quality for campus practice base and practical teaching, but that’s not enough.

The Consequence of Off-Campus Practice Base Was Unsatisfactory

In order to meet the needs of the teaching, colleges build a batch of practical teaching base inside and outside of the school. There are some issues: the enterprises didn’t care the practical teaching base because of the students' safety, unprofitable and production of their own. The university-enterprise cooperation was more and more became a mere formality. On the other hand it was difficult to give full play to the performance of the campus practice base, and some high value equipment became a showpiece, of course, the subject of the training is single. The role of training base in practical teaching is far from expected, also is out of step with input.

The Ability of Training Teachers Needs to Improve

It was common phenomenon that the quantity of the training teacher couldn’t meet the needs, and the income of them was less than others, because of the gap between theory teaching and practice teaching. Some teachers of the training had highly educated, but the ability of the operation was low. Teachers who had a long time out of the construction unable to carry out “case teaching” because of the lack on engineering experience. The part-time training teachers from the off-campus are too simple about the teaching methods to extrapolate in the training.

The Connotation of the Training about the Practice-Oriented Based on the Qualification

Construction qualification examination provides the reference coordinates for talents training, the ultimate goal of applied universities is to cultivate qualified professionals for the jobs in the future, strengthen the practice teaching is one of the important and effective measures. Applied colleges and universities to carry out the pertinence and systematic training based on the qualification and comprehensive ability, it helps students to improve the effect of training, and of course for the comprehensive quality.

Western students training system is closely connected with the examination system of professional. The main evaluation about students of the BTEC which from British is to solve
practical problems in the society and the enterprise training. The one of the key factors of successful for German vocational education is implement the system of professional qualification certificate strictly. The Swiss government had a clear regulations on university-enterprise cooperation\[15\]. The training teaching based on qualification, can make the students identify one or two specific qualification for targeted training. It will mobilize the students’ enthusiasm and initiative, both at the depth and breadth about the training.

The Exploration on the Practice Teaching Mode

The intrinsic quality of the applied colleges and universities is “to learn, to use”, the “learn” is the basic, but the “use” is the key. To develop students’ practical training based on the qualification which should matched with the career planning of their own, and make the students' ability to achieve the requirement of the job are the cores for the training based on the qualification. It will make the coast that experiment \(\rightarrow\) basic practice \(\rightarrow\) comprehensive training \(\rightarrow\) field work is very clear.

Change Ideas, Pay Equal Attention to "Academic" and "Technology"

Emphasizes the status of practice teaching in the talent training scheme, and change the traditional ideas that the “academic” is more important than “technology”. The talent training scheme of the Xichang College added the comprehensive practice training. According to the exploration many years, the proportion about the practice credits of the total credits is 44.5\%. Arranging the training weeks in the process of teaching first, and then the other training and the theory teaching. Practice teaching appraised separately, and it improves the enthusiasm of the teachers and students in the practice teaching.

Optimize the Talent Training Scheme Following the Development of the Construction

The premise condition of the major development and personnel training is talent training scheme. The way that makes the major keeps up with the development of the industry is determined the talent training scheme by both college and enterprises. Xichang College is a member of the SICHUAN Construction Talent Development Council, it is easy to invite the enterprises and alumnus to advice about the development for major and personnel training.

Mutual Benefit between College and the Enterprise on the Off-Campus Training Base

Sharing training base, is the foundation of off-campus training base to improve the effects of operating. Talent training is the goal of the college, and the company also needs to train employees. The off-campus training base which based on the qualification can service the practice teaching and also provide a platform for the enterprise. Use of base of teachers and equipment resources for the enterprise into new technologies, new methods\[16\]. This is a win-win station that the off-campus training base development by college and enterprise. It’s a reciprocity for both college and enterprise by the college as core and by the bases as link.

Promoting the Campus Training Base Construction by Practice

Xichang College is the member of the "double certificate" education by Sichuan province construction department. Obey the stander of the "double certificate" education, improve the campus training base about the hardware and software. After the examination both practical and theory, the senior students will be given the job training certificate such as builder certificate, certificate of quality engineer, materials certificate. That’s a good news for students to adapt the engineering jobs and develop their own quality.

Improving Teachers' Ability of Qualification

Teachers’ ability of qualification determines the effect of the practice teaching which based on the qualification. Teachers should have training in the enterprises to improve the ability of practice. Introducing part-time teachers who are project managers and senior engineers, so the main courses
and comprehensive training of the students would be taught by engineering practice ability of teachers.

There were 22 "double division" teachers in the Xichang College, such as registered architects, registered construction engineer and senior engineers. The teachers often to the construction site, so that they can master the development of engineering development, and update the content of teaching and improving teaching methods at any time.

Acknowledgement

It is necessary to overcome the tendencies of the academic orientation and quality education generalization. Building professional education, certified engineer qualification education and career planning education engineering, is the core content about the reform of personnel training mode in the civil engineering universities. The practical training of the applied engineering education based on qualification, makes the purpose of training can be seen and the effect can be quantified. After years of exploration in Xichang College, the training based on qualification improves the ability and engineering consciousness of the students. Over the years, the school of engineering students one-time employment rate over the 98%, professing rate is above 90%, students of the building get the qualification certificate when graduation, the students' comprehensive quality and professional quality received the affirmation of unit of choose and employ persons. The class of 2008 ~ 2012 graduate, to be going to work through the inspection qualification certificate for practicing as a registered students reached 31.3%.

References

[1] Housing urban and rural development several opinions about promote the development of construction and reform. 2014.7.1


